SERVICE MANUAL

(without price)

ELECTRONIC CASH REGISTER

CE-2400 (EX-259B)

OCT. 1996

Printer Model : CR-710

CASIO

INDEX

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1. FEATURES

The difference between CE-2350 and CE-2400 is as follows.

Item	CE-2350	CE-2400
Department number	38	40
PLU number	400	500
Clerk number	10	20
Calculator function	Nil	Available

2. SPECIFICATIONS

2-1. Electrical specifications

• Power consumption	Specification In operation Max. Min. Power OFF	0.35 A 0.22 A 0.09 A 0.08 A
• Memory protection	Back-up battery Back-up period Battery life	Mangan battery (UM-3 × 3 pcs.) 1 year (25 °C) Replace the battery every year.
• Clock & Calendar	Accuracy Auto calendar	Within ±120 sec. per month (25 °C) Effective until 2099 A.D.

2-2. Environmental specifications

• Operating temperature	0 °C ~ 40 °C
• Operating humidity	10 % ~ 90 %
• Storage temperature	-25 °C ~ 65 °C
• Storage humidity	10 % ~ 95 %
• Vibration strength	1.5 G (The machine must be in the carton box)

2-3. Principal components

• CPU	Name Number of control bit Internal RAM Internal ROM Main system clock Sub system clock	μPD75517GF-400-3B9 4 512 × 4 bits 12160 × 8 bits 4.19 MHz 32.768 KHz
• RAM	Name Capacity	LC36256AL70/85/10 32 KB

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• Printer	Name Print method Receipt number Print digit Printing speed MCBF Paper width Paper diameter Paper thickness Ink roll Ribbon life	CR-710-001 Rubber-type inner-hummer printing system 2 receipt (Receipt & Journal) 12 digits (Numeric: 10 digits, Symbol: 2 digits) Approx. 2.4 lines/sec. 1,500,000 lines W 44.5 ± 0.5 mm 83 mm or less 0.06 ~ 0.09 mm IR-93 400,000 lines
• Display	Name Number of digit	LED (HDSP-5261) 8 digits (LED × 4 pcs.)
• Power transformer	Name	TE-233-E4D
• Keyboard:	Input system	2 keys roll over
• Drawer	Name	DL-2416 (D-15TC-A55SP-1*) M type drawer for U.S.A.

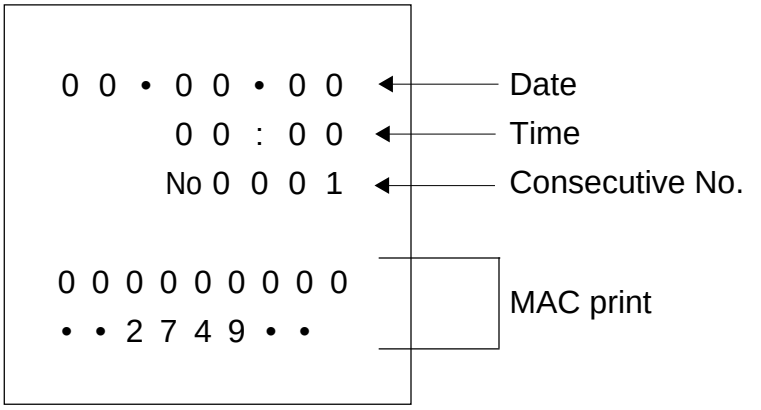
2-4. Option

• Wet cover	Name	WT-63
• Power protection battery (B-6)	Drive period	Approx. 3 hours with the following conditions
	Drive conditions	Processing time: 60 sec./customer Quantity of sales: 8 items/customer Registered amounts: 3 digits/item Number of customer: 25 persons/hour
	Charging time	8 hours to full charge

3. MAC (Memory All Clear) OPERATION

Procedure

(1) Plug the power cord into an outlet.
(2) Pressing the JOURNAL FEED button and turn the mode switch to Z position.
(3) Release the JOURNAL FEED button. After few seconds, MAC operation will be executed.
(4) The following receipt will be issued, if completed.



Notes:

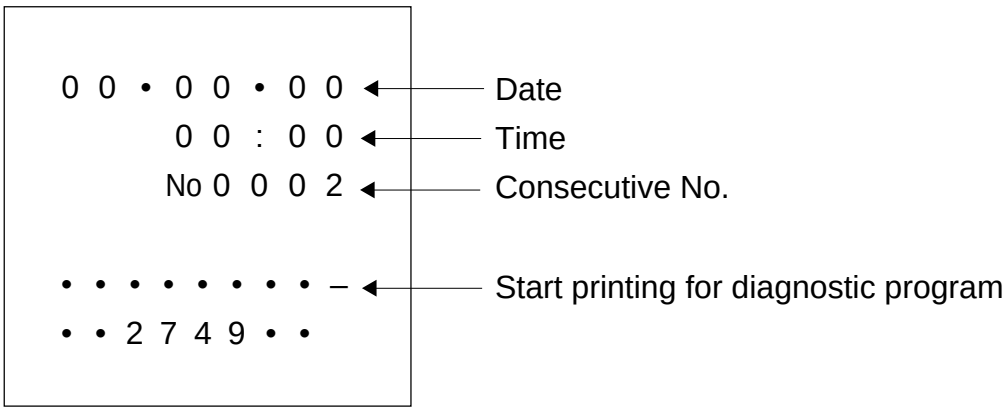
1. After initialize operation, the clock counts from 00 : 00 A.M. and also the calendar is started from 00 - 00 - 00.
2. If the memory of RAM is broken, the machine will be initialized after power on.

4. DIAGNOSTIC OPERATION

4-1. How To Start

(1) Plug the power cord into an outlet.
(2) Execute the MAC operation.
(3) Turn the mode switch to "Z" position.
(4) Input 99999999 and press the sub total button.
(5) Start the diagnostic program and issued following receipt.

Note: If you have done the registration after MAC operation, the Diagnostic program can not start.



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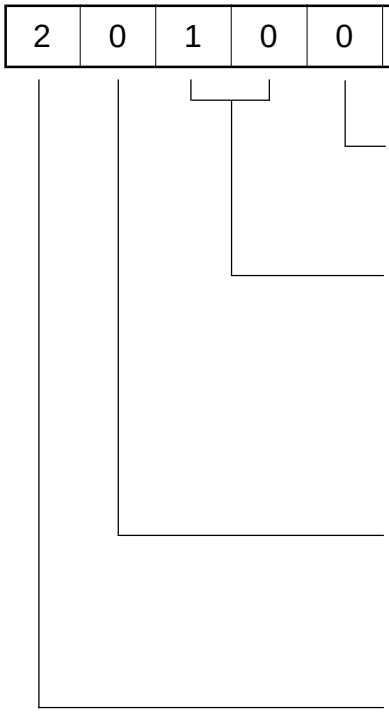
4-2. Mode switch and PAD status display check

When the Clear key is pressed or changing the position of mode switch, the machine displays the mode switch position.



1	Drawer open
0	Drawer close

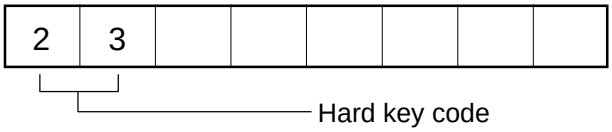
	PAD 1	PAD 2	
0 0	Short	Short	Canada
0 1	Open	Short	
1 0	Short	Open	
1 1	Open	Open	U.S.

8	Receipt OFF
0	Receipt ON

1	Z
2	X
4	REG
8	RF

4-3. Hard key code check

When all keys except numerical keys, Clear key, RECEIPT FEED key, JOURNAL FEED key are pressed directly, the machine displays the hard key code as shown below.



Receipt FEED	Journal FEED
47	51
46	50
45	49
44	48

C	13	14
7	8	9
4	5	6
1	2	3
0	10	11

20	26	32	38	43
19	25	31	37	42
18	24	30	36	41
17	23	29	35	40
16	22	28	34	39
15	21	27	33	

4-4. Hard check function

Enter 1 digit from numeral key and press the sub total button (ST), the following Hard check function will be executed.

(1) [1] + [ST] : Display, RAM, Drawer, Printer check
(2) [5] + [ST] : RAM read only check
(3) [7] + [ST] : Voltage check of memory back-up battery
(4) [8] + [ST] : Print all characters
(5) [9] + [ST] : Display the time

4-4-1. Display, RAM, drawer and printer check

Operation : [1] + [ST]

(1) All segments turn on.

8	8	8	8	8.	8.	8.	8.

(2) Date and time set

Set the following data in the machine automatically.

Date : 1st. January 1992

Time : 12 : 34 : 00

(3) RAM write and read check

The machine writes data into RAM and read out the data to compare with written data. When this check is finished correctly, the machine goes to check No. (4). However, if an error is occurred, the machine sounds an error tone, prints the error receipt, and stops Hard check program.

Error receipt sample " -- -- "

(4) Drawer open check

Open the drawer.

(5) Printing check

Print the following character.

Z 0 0 0 0 0 0 0 0 0 CA CD

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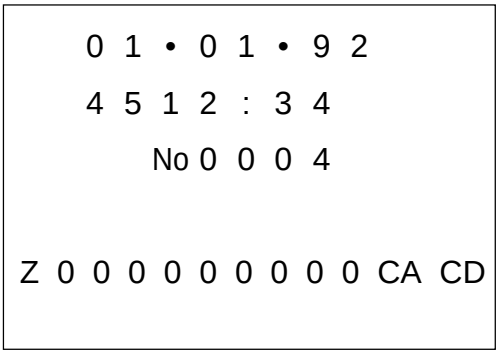
(6) Receipt issue

The following receipt is issued.



(7) Test display

7	6	5	4	3	2.	1	0

4-4-2. RAM read only check

Operation : [5] + [ST]

Note: Be sure to execute the RAM write and read check (1 + ST) before this check.

The machine reads out the data to compare with written data until an error is occurred and blinks " -- " on the display during this check.
To stop this check, turn the mode switch to OFF position.
If an error is occurred, the machine sounds an error tone, prints " -- -- " on the receipt, and stops this check.

4-4-3. Voltage check of memory back-up battery

Operation : [7] + [ST]

Display the voltage of back-up battery in real time. (Measurement is Volt (V) level.)
To stop this check, turn the mode switch to OFF position.

4-4-4. All characters print check

Operation: [8] + [ST]

```
      01•01•92
      45  12:36
          No0005

Z 0 0 0 0 0 0 0 0 0 CA CD
1 1 1 1 1 1 1 1 1 1 CH I
2 2 2 2 2 2 2 2 2 2 RA II
3 3 3 3 3 3 3 3 3 3 PO III
4 4 4 4 4 4 4 4 4 4 CK IV
5 5 5 5 5 5 5 5 5 5 # ST
6 6 6 6 6 6 6 6 6 6 VD CG
7 7 7 7 7 7 7 7 7 7 TX Q
8 8 8 8 8 8 8 8 8 8 TA @
9 9 9 9 9 9 9 9 9 9 NS AT
★ ★ ★ ★ ★ ★ ★ ★ ★ + CR TL
• • • • • • • • • – ✻ –
X PL No : % RF
```

4-4-5. Display the time

Operation: [9] + [ST]

The machine display the time.
To stop this check, press the Clear key.

12--34 01 The time counts up.

If you make following operation, the machine resets the time data and starts again.

Operation: [9] [9] + [ST]

4-4-6. How to release the diagnostic mode

Execute MAC operation.

5. OPTION CIRCUIT

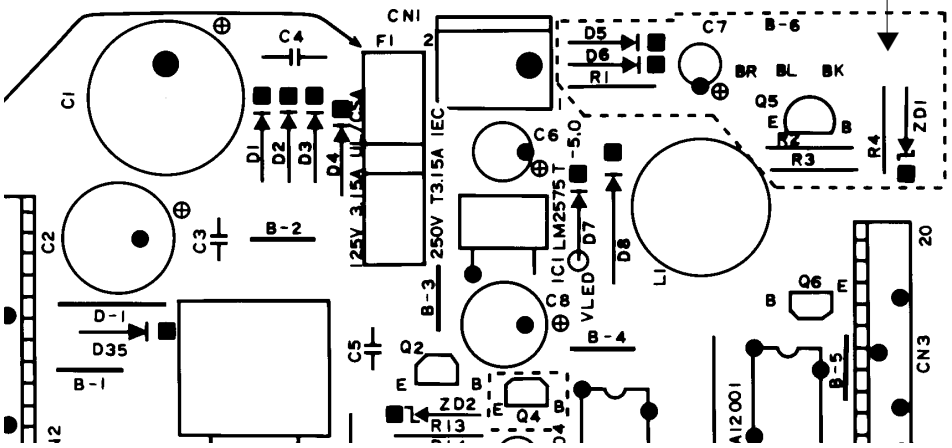
Power protection battery B-6

Power protection battery B-6 is available for CE-2350.
However, interface circuit is not mounted to the machine.
When you use the B-6, mount the following parts.

Parts list for interface

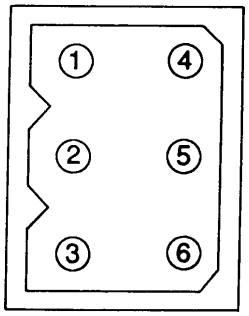
Code No.	Parts Name	Specification	Q'ty
2200 3577	Transistor	2SA1015 (GR, O, Y)	1
2301 0011	Diode	1S2471	2
2310 3541	Zener diode	RD12EB2	1
2600 7313	Carbon film resistor	R-25-10K-J	3
2614 0552	Carbon film resistor	R-25-2K-J	1
2801 7098	Electrolytic capacitor	50RE2	1
6219 4553	Connector fixing plate	E311094-1	1
6236 6180	P1625-06P connector ass'y	E314531B-10 (#22-200)	1

Interface circuit for B-6



Pin assignment for B-6 connector

Pin layout



Pin No.	Description
1	F.G. (Green)
2	Not used
3	CS (Black)
4	GND (Blue)
5	Not used
6	VP (Brown)

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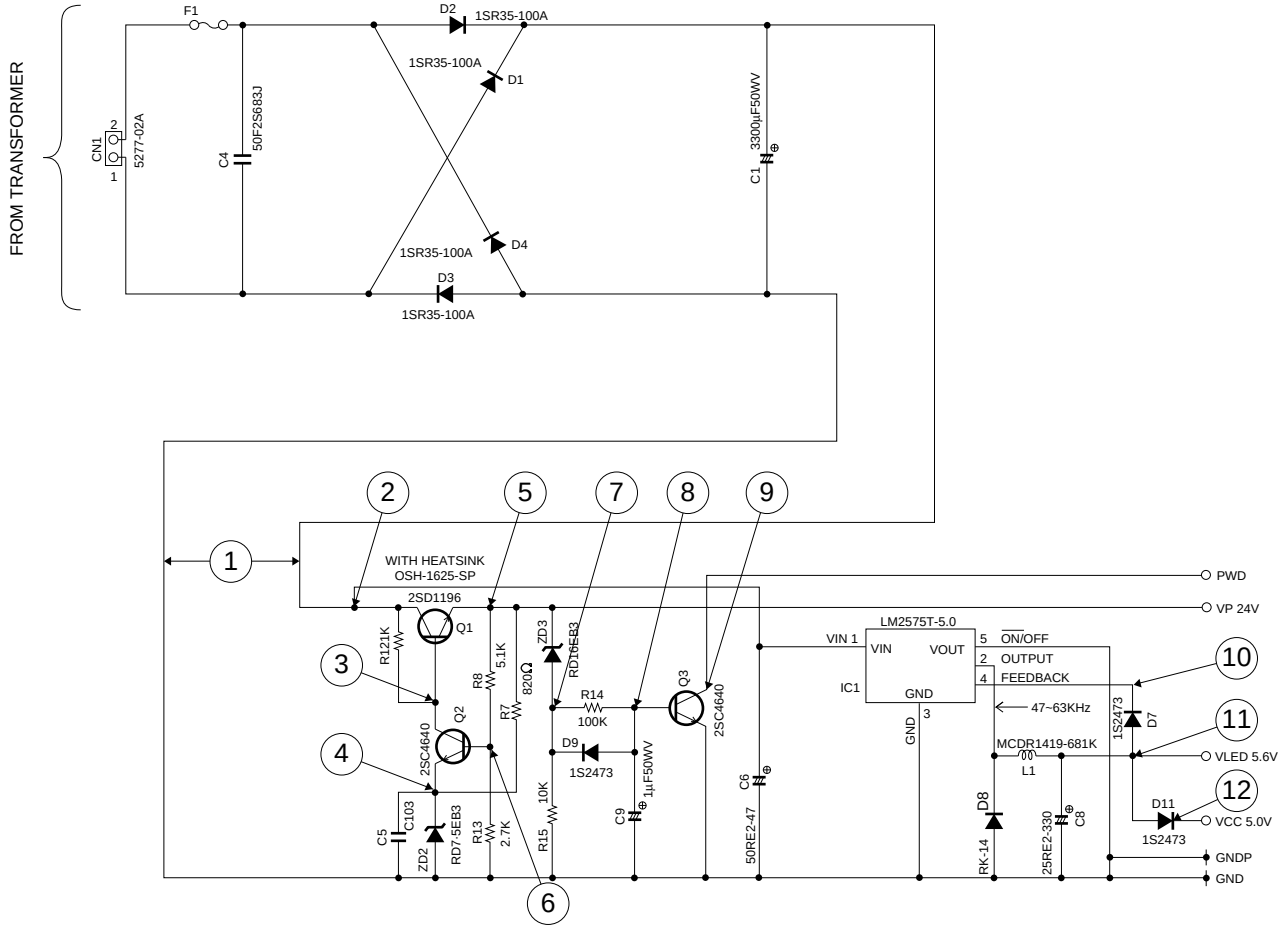
6. CIRCUIT EXPLANATION

6-1. Power supply circuit



Q1 : Transistor for controlling voltage (VP)
Q2 : Transistor for voltage detection
Q3 : Transistor for controlling power down (PWD) signal
ZD2 : Zenner diode for controlling base current of Q2
ZD3 : Zenner diode for detecting power down (PWD) signal

After plugging the AC cord into the outlet, the AC voltage (23.8 V) appears at CN1 connector. Then this voltage is rectified by the diode bridge and it become constant voltage through the capacitor C1.

[Voltage VP]

A constant voltage (31.4 V) appears on the "2" position. This voltage made from the constant voltage circuit consist of transistor Q1 and Q2, zener diode ZD2, resistor R7, R8, R12 and R13.

[Voltage VLED and VCC]

The voltage goes to pin No.1 of regulator IC1 and then it is out from pin No.2 of IC1 as stable voltage (5.6 V).
Then this voltage falls down to 5 volts through the diode.
It is used for VCC (for logic) and VLED (for display drive).
Also, it goes to pin No.4 of IC1 and using to control the output voltage level.
Inductor L1 is used to stabilize the VCC voltage when the drawer opened.

[PWD signal]

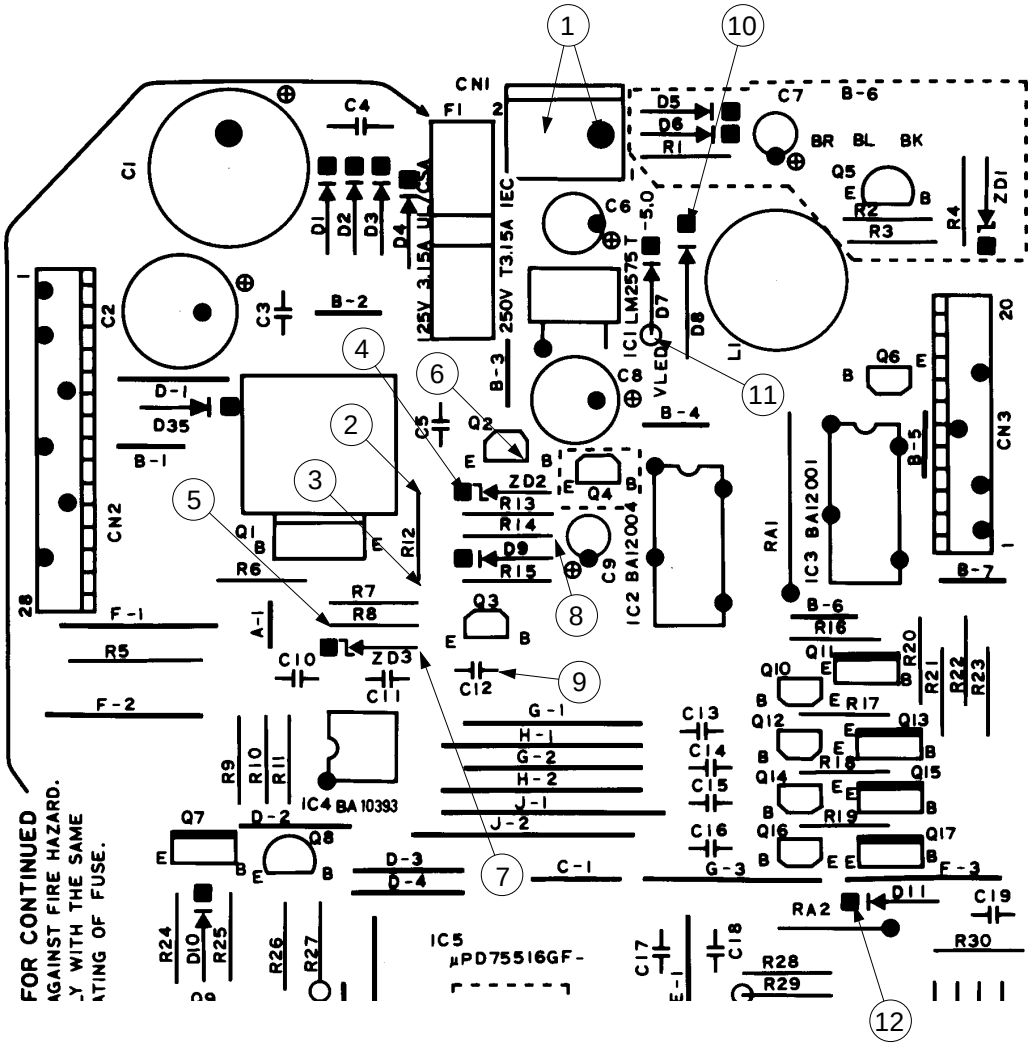
After plugging the AC cord into outlet, VP voltage appears on the base terminal of transistor Q3.
When the VP exceeds 16 volts, Q3 is turned on by the differential voltage between base and emitter terminal of transistor Q3.
Then the PWD signal goes to GND level and informs "Power ON" to the CPU.
When the VP drops less than 16 volts, Q3 is turned off.
Then the PWD goes high level since the PWD is pulled up to VDD.
When the CPU receives "High" signal of PWD, CPU goes to "Power failure process".

Note: When plugging the AC cord into outlet, all voltages are supplied to the PCB.
If you open the machine for repair, make sure to unplug it.

[Location for voltage check points]

Actual value on the E259-1 PCB [unit : V]

Check point	1	2	3	4	5	6	7	8	9	10	11	12
Power ON	23.8(AC)	31.4	25.2	7.61	24	8.2	8.1	0.6	0	5	5.6	5
Power cord off	0	0	0	0	0	0	0	0	0	0	0	0



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6-2. CPU (μPD75517GF-400-3B9)

Pin No.	Signal	Descriptions	I/O	PW-on level
1	AN0	Mode switch signal (RF, OFF, REG, X, Z) signal	In	2.0V
2	AVREF	VCC terminal (+5 V)	—	5.0V
3	VDD	VDD terminal (+5 V)	—	5.0V
4	VDD	VDD terminal (+5 V)	—	5.0V
5	P113	Motor drive signal (M4)	Out	Low
6	P112	Motor drive signal (M3)	Out	High
7	P111	Motor drive signal (M2)	Out	Low
8	P110	Motor drive signal (M1)	Out	Low
9	P103	Stamp/Clock signal	Out	Low
10	P102	RAM address signal (A12)/Receipt and Journal feed (FEED)	Out	Low
11	P101	RAM address signal (A09/A11)/Head drive signal (HD6)	Out	Low
12	P100	RAM address signal (A08/A10)/Head drive signal (HD5)	Out	Low
13	P93	RAM address signal (A03/A07)/Head drive signal (HD4)	Out	Low
14	P92	RAM address signal (A02/A06)/Head drive signal (HD3)	Out	Low
15	P91	RAM address signal (A01/A05)/Head drive signal (HD2)	Out	Low
16	P90	RAM address signal (A00/A04)/Head drive signal (HD1)	Out	Low
17	SI1/P83	Key input signal (KI7)	In	High
18	SO1/P82	Key input signal (KI6)	In	High
19	SCK1/P81	Key input signal (KI5)	In	High
20	PP0/P80	Key input signal (KI4)	In	High
21	KR7/P73	Not used	Out	—
22	KR6/P72	Display segment signal (SG1)	Out	Pulse
23	KR5/P71	Display segment signal (SF1)	Out	Pulse
24	KR4/P70	Display segment signal (SE1)	Out	Pulse
25	KR3/P63	Display segment signal (SD1)	Out	Pulse
26	KR2/P62	Display segment signal (SC1)	Out	Pulse
27	KR1/P61	Display segment signal (SB1)	Out	Pulse
28	KR0/P60	Display segment signal (SA1)	Out	Pulse
29	P53	Display segment signal (SDP0)	Out	Pulse
30	P52	Display segment signal (SG0)	Out	Pulse
31	P51	Display segment signal (SF0)	Out	Pulse
32	P50	Display segment signal (SE0)	Out	Pulse
33	VSS	GND terminal	—	—
34	P43	Display segment signal (SD0)	Out	Pulse
35	P42	Display segment signal (SC0)	Out	Pulse
36	P41	Display segment signal (SB0)	Out	Pulse
37	P40	Display segment signal (SA0)	Out	Pulse
38	P33	Display segment common signal (Dg4)	Out	Pulse
39	P32	Display segment common signal (Dg3)	Out	Pulse
40	P31	Display segment common signal (Dg2)	Out	Pulse
41	P30	Display segment common signal (Dg1)	Out	Pulse
42	P23/BUZ	Buzzer signal	Out	Low
43	P22/PCL	Motor drive signal (for paper feeding)	Out	Low
44	P21	Step motor common signal (for print wheel)	Out	High
45	P20/PT00	Drawer open signal (DW)	Out	Low
46	P13/TI0	Key input signal (KI9)	In	High
47	P12/INT2	Key input signal (KI8)	In	High
48	P11/INT1	Power down signal	In	Low
49	P10/INT0	Reset pulse from printer	In	High

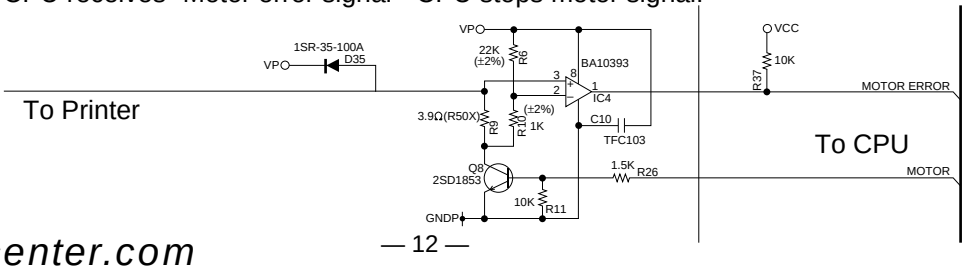
Pin No.	Signal	Descriptions	I/O	PW-on level
50	P03/SI0/SB1	Key input signal (KI3)	In	High
51	P02/SO0/SB0	Key input signal (KI2)	In	High
52	P01/SCK0_	Key input signal (KI1)	In	High
53	P00/INT4	Key input signal (KI0)	In	High
54	VSS	GND terminal	—	—
55	XT1	Sub system clock signal (32.768 KHz)	In	Pulse
56	XT2	Sub system clock signal (32.768 KHz)	In	Pulse
57	IC	GND terminal	—	—
58	X1	Main system clock signal (4.19 MHz)	In	Pulse
59	X2	Main system clock signal (4.19 MHz)	In	Pulse
60	RESET_	Initialize signal	In	High
61	P143	RAM write enable signal (WE_)	Out	High
62	P142	RAM chip enable signal (CE_)	Out	High
63	P141	Journal feed common signal	Out	Low
64	P140	Receipt feed common signal	Out	Low
65	P133	RAM data signal (D3)	I/O	High
66	P132	RAM data signal (D2)	I/O	High
67	P131	RAM data signal (D1)	I/O	High
68	P130	RAM data signal (D0)	I/O	High
69	P123	Key common signal (Kc02)	Out	Pulse
70	P122	Key common signal (Kc01)	Out	Pulse
71	P121	Key common signal (Kc00)	Out	Pulse
72	P120	RAM address signal (A14)	Out	Low
73	AVSS	GND terminal	—	—
74	P153/AN7	Receipt ON/OFF signal	In	High
75	P152/AN6	Motor error signal	In	Low
76	P151/AN5	Pad data signal (PAD2)	In	High
77	P150/AN4	Pad data signal (PAD1)	In	High
78	AN3	GND terminal	—	—
79	AN2	Battery voltage detection terminal	In	0 ~ 4.5V
80	AN1	Drawer sensor signal	In	Low

Note: The "PW-ON level" is measured under following conditions.

(1) Mode switch is REG position.
(2) The display is the time.
(3) Receipt switch is ON position.
(4) PAD1 and PAD2 are both open.

6-3. Motor error detection circuit

When CPU output motor signal, transistor Q8 becomes on and the voltage level at "A" point becomes GND. Then, paper feeding motor rotate. Normally, pin No. 1 of IC4 appears low signal.
IC4 detects differential voltage between pin No. 2 and 3.
In case pin No. 3 is higher than No. 2, output (pin No. 1) signal is high.
If motor happens over load (paper jam etc.), over load current (250mA) runs resistor R9. So "A" point voltage level becomes high.
Then IC4 outputs high signal and then CPU knows motor error occured.
Whe the CPU receives "Motor error signal" CPU stops motor signal.



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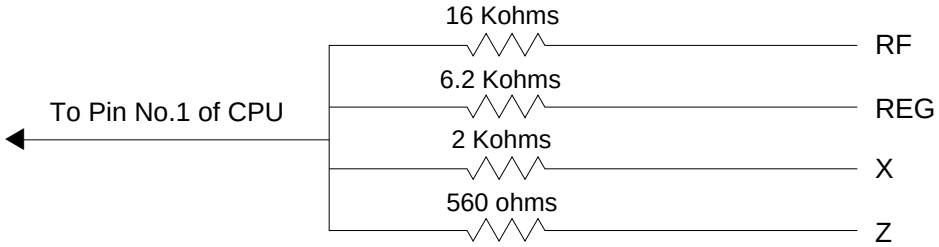
6-4. Mode key switch status read

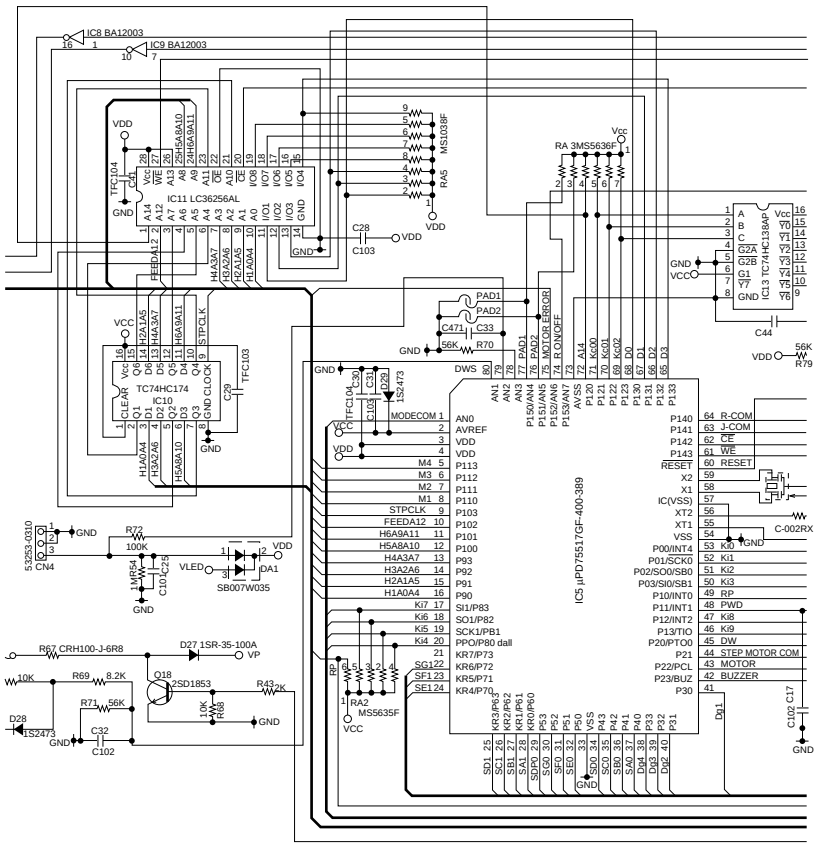
The CPU knows the mode switch status by voltage level of pin No.1.
The voltage level is down by resistor. Each voltage is as shown below.

Mode	REG	X	Z	RF	OFF
Voltage (V)	196	3.29	4.36	0.98	0



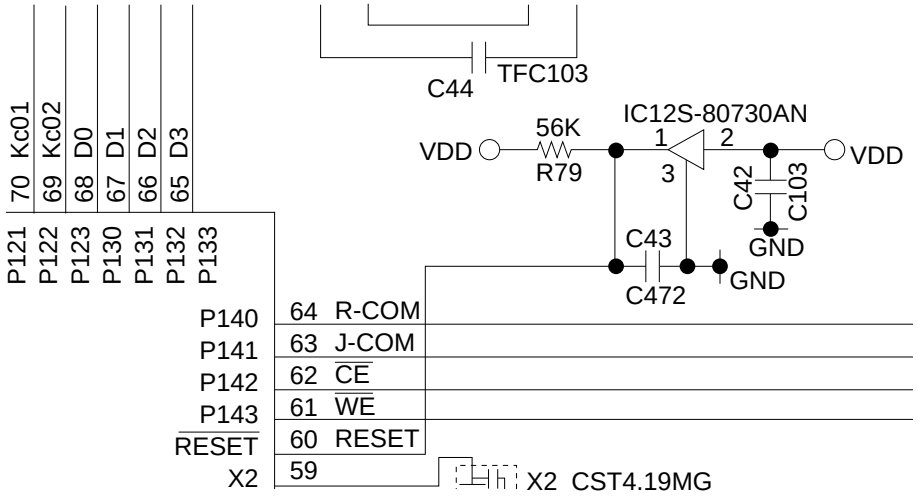
6-5. RAM address/head drive signal switching circuit

The CPU uses the port for RAM address (A0 ~ A11) and head drive signal (HD1 ~ HD6).
To select the RAM address and head drive signal, CPU use "STEP MOTOR COM" signal.
When CPU wants to read the RAM chips, CPU stops "STEP MOTOR COM" signal.
The CPU controls RAM address (A0 ~ A12) using IC 10 because CPU has 7 ports.
First, CPU sends RAM address (A4 ~ A7, A10, A11) to IC10 and IC10 store the address data.
Next, CPU sends RAM address (A0 ~ A3, A8, A9, A12, A14) to RAM.
At the same time, CPU sends clock signal to IC10.
Then, IC10 outputs stored data (A4 ~ A7, A10, A11). In this way, CPU controls RAM address.



6-6. Initialize IC (Reset IC)

When the voltage level on pin No. 60 of CPU is not stabilized, CPU does not work properly in rare case. Therefore, this machine uses the initialize IC for stabilizing the voltage.
Even the voltage level of VDD (Pin No. 2) is changed of initialize IC,Initialize IC output stabilized 5 volts from pin No.1.



6-7. Printer error condition of CPU

(1) When motor error signal comes, CPU knows printer error.
(2) When reset pulse does not come within a period of time which is controlled by CPU, CPU knows printer error. Then, CPU stops printing.
CPU selects printing character by software.

6-8. Error code

Error code	Meaning	Action
E01	Mode Switch position changed before finalization.	Return the Mode Switch to its original setting and finalize the operation.
E08	Registration without entering a clerk number. This error appears only when the clerk control function is activated.	Enter a clerk number.
E11	Registration attempted while the drawer of the register is open.	Shut the drawer before attempting to perform a registration.
E27	Transaction cancel buffer is full.	Finalize the transaction.
E38	READ/RESET operation without declaration of cash in drawer. This error appears only when the money declaration (cash in drawer amount input) is required by programming.	Perform money declaration.

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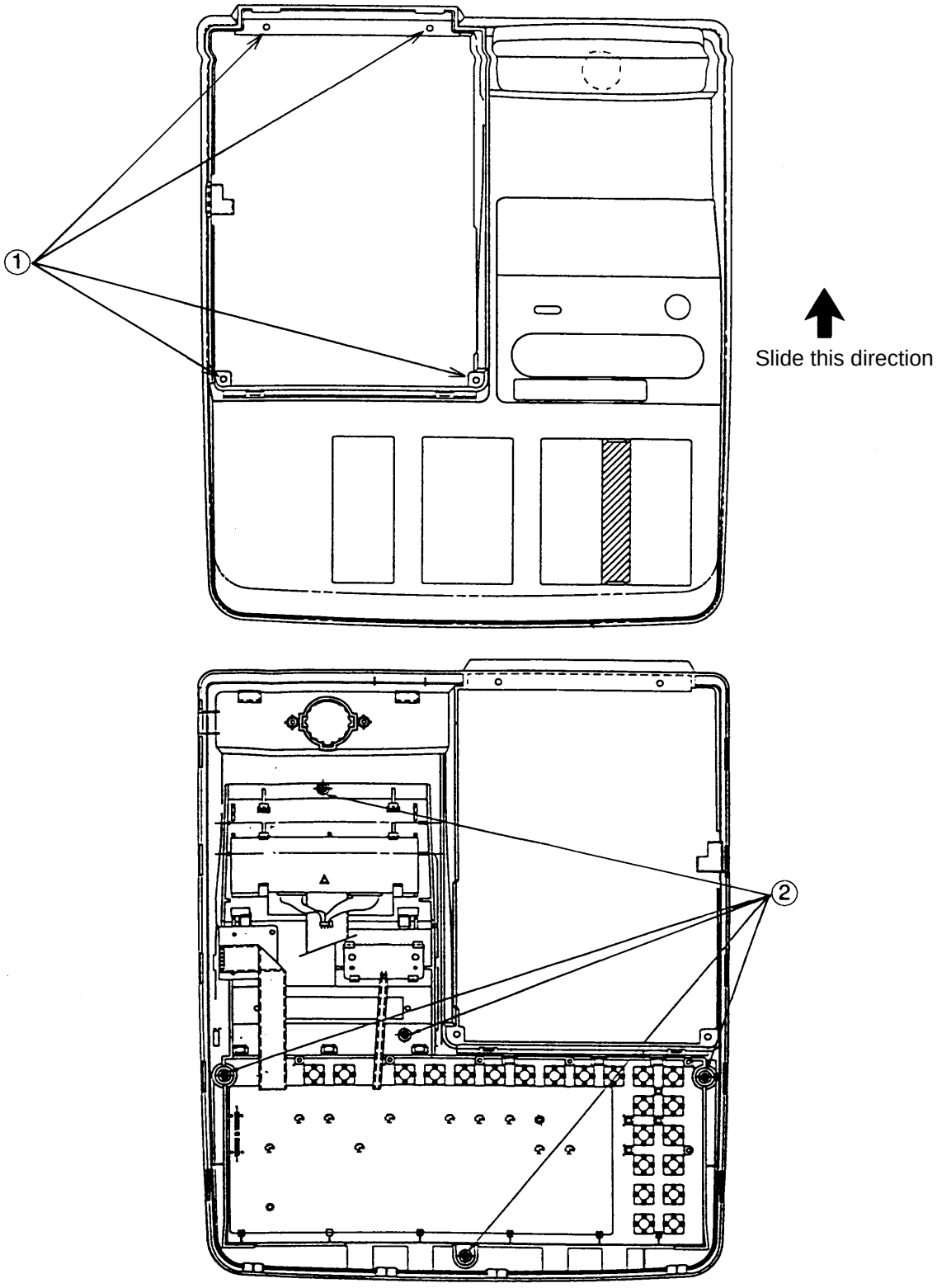
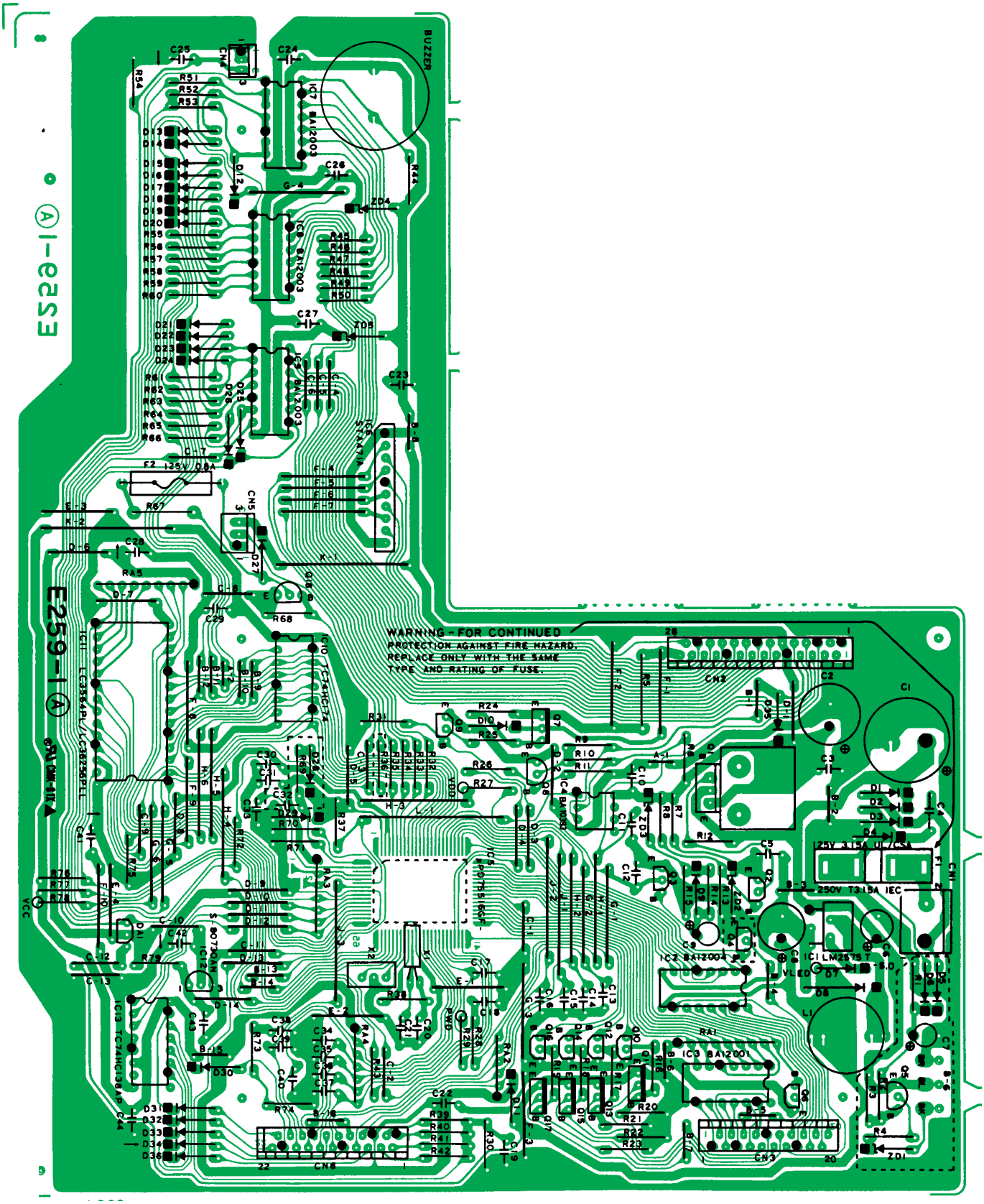
7. TO OPEN THE UPPER CASE

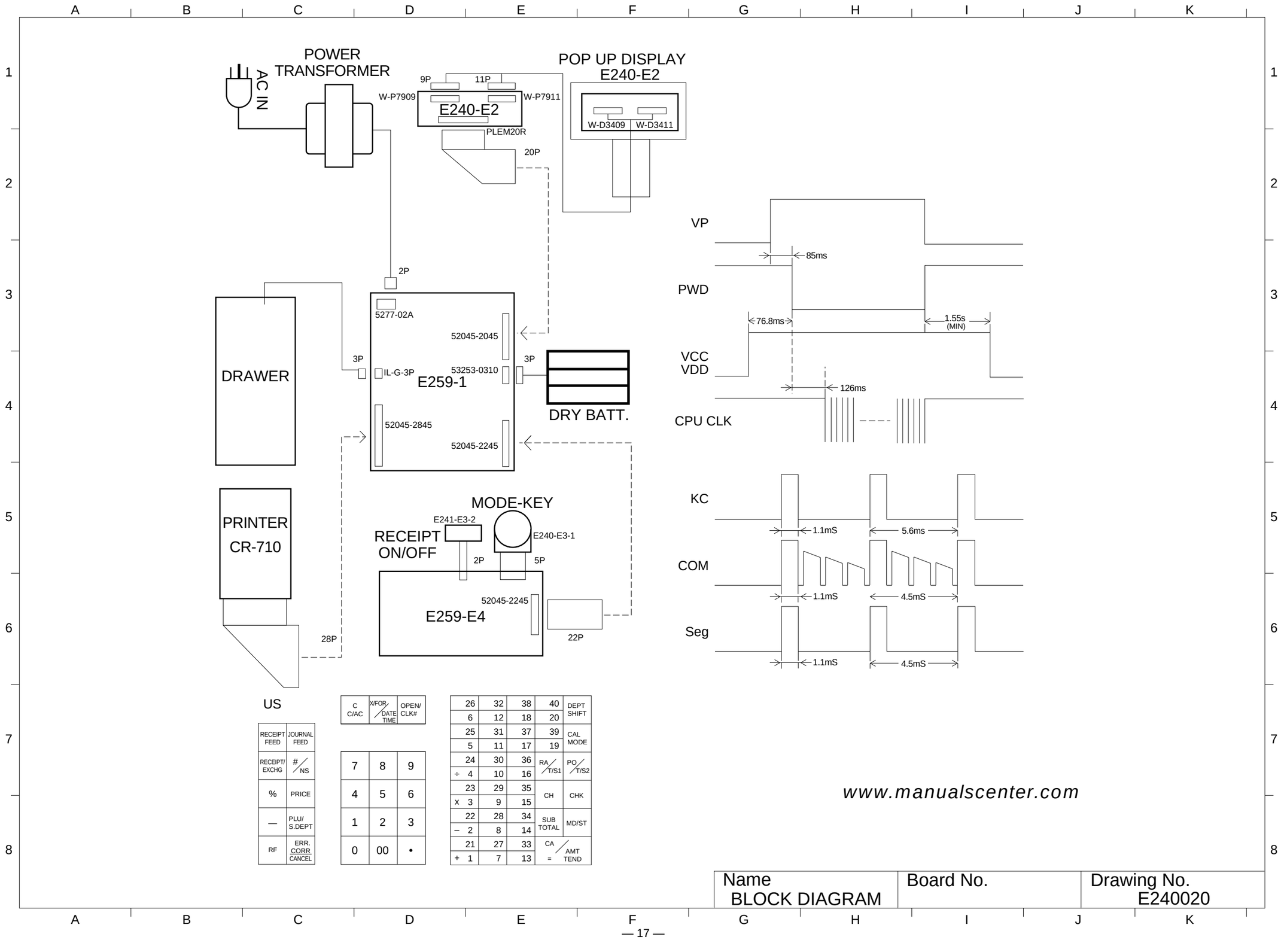
(1) Remove the printer cover.
(2) Remove the four screws ① near the printer unit.
(3) Slide the upper case to backward and pull it up then remove it.
(4) Remove the five screws ② to separate the keyboard.



8. PCB LAYOUT


E259-1 Ⓐ
WARNING - FOR CONTINUED
PROTECTION AGAINST FIRE HAZARD,
REPLACE ONLY WITH THE SAME
TYPE AND RATING OF FUSE.
BUZZER

9. CIRCUIT DIAGRAM



RECEIPT FEED	JOURNAL FEED	
RECEIPT/ EXCHG	# / NS	
%	PRICE	
—	PLU/ S.DEPT	
RF	ERR. CORR CANCEL	

C C/AC	X/FOR / DATE TIME	OPEN/ CLK#

7	8	9
4	5	6
1	2	3
0	00	•

26	32	38	40	DEPT SHIFT
6	12	18	20	
25	31	37	39	CAL MODE
5	11	17	19	
24	30	36	RA / T/S1	PO / T/S2
÷ 4	10	16		
23	29	35	CH	CHK
x 3	9	15		
22	28	34	SUB TOTAL	MD/ST
− 2	8	14		
21	27	33	CA / =	AMT TEND
+ 1	7	13		

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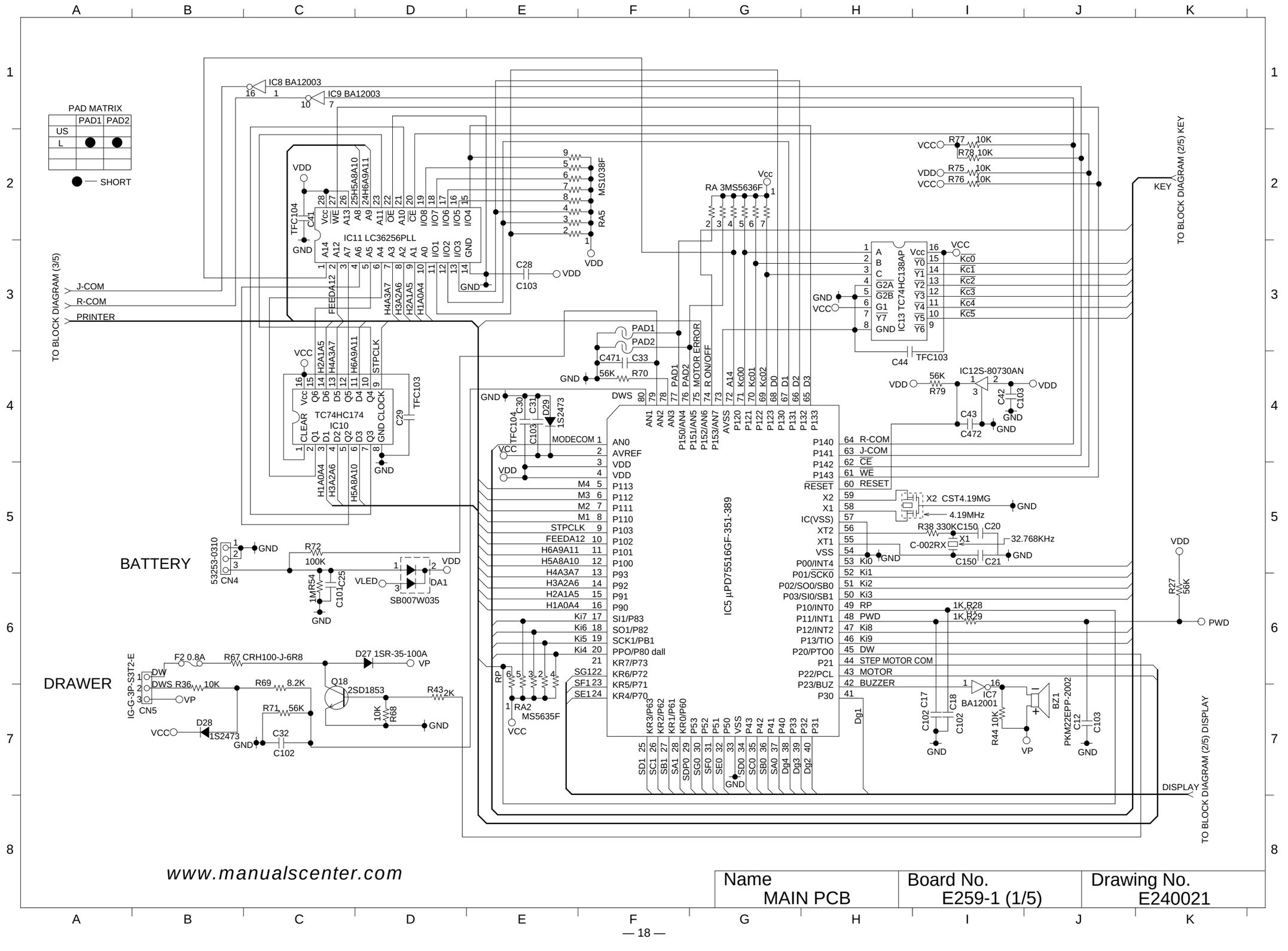
Name	Board No.	Drawing No.
BLOCK DIAGRAM		E240020


PAD MATRIX
PAD1 PAD2
US
L
SHORT
IC8 BA12003
IC9 BA12003
IC11 LC36256PLL
TFC104
MS1038F
RA5
RA 3MS5636F
IC13 TC74HC138AP
TC74HC174
IC10
TFC103
IC12S-80730AN
IC5 µPD75516GF-351-389
RA2 MS5635F
BATTERY
CN4
SB007W035
DRAWER
CN5
IG-G-3P-S3T2-E
2SD1853
1S2473
BA12001
PKM22EPP-2002
X2 CST4.19MG
4.19MHz
32.768KHz
C-002RX
TO BLOCK DIAGRAM (3/5)
TO BLOCK DIAGRAM (2/5) KEY
TO BLOCK DIAGRAM (2/5) DISPLAY
J-COM
R-COM
PRINTER
KEY
PWD
DISPLAY
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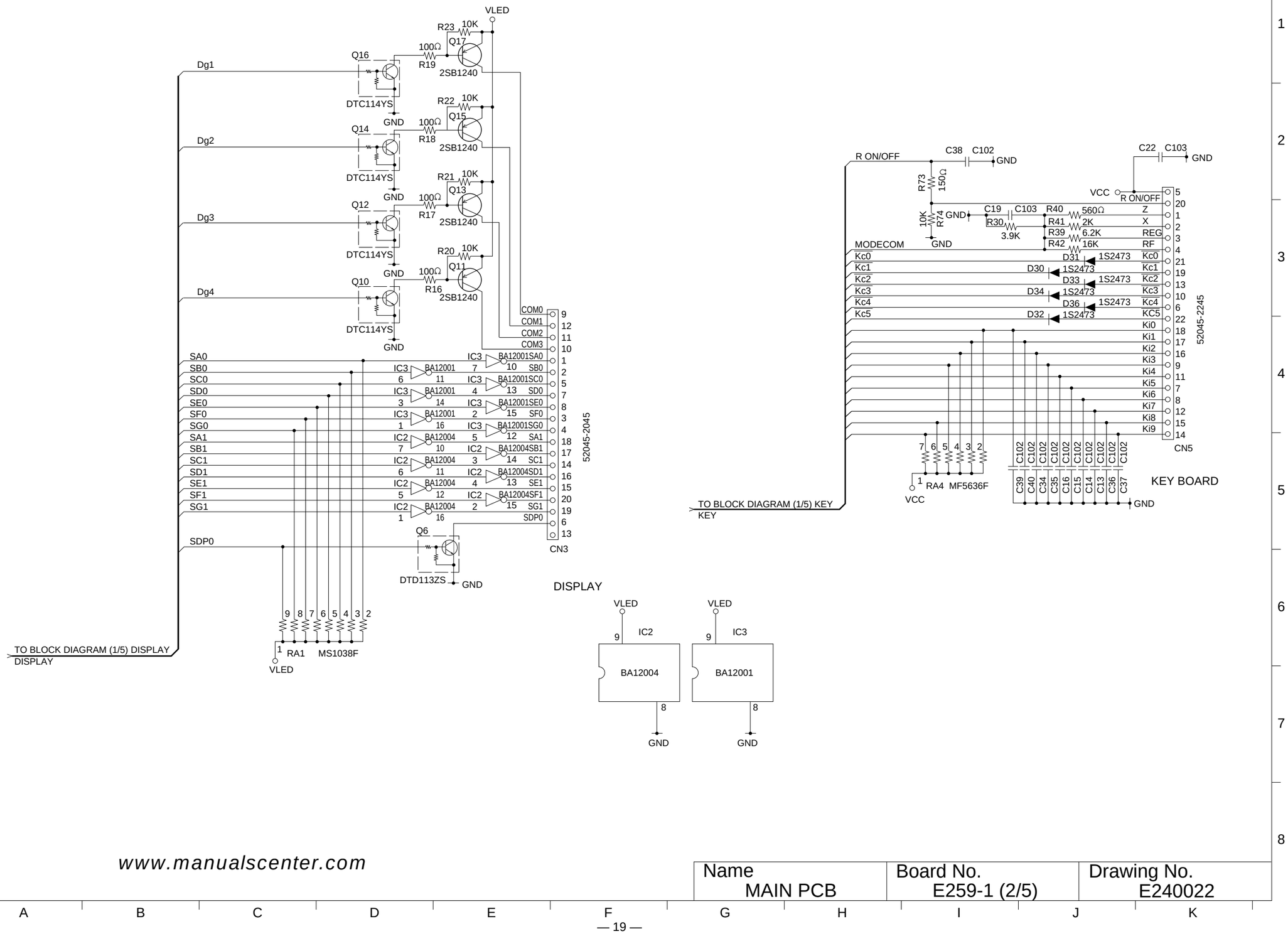
Name
MAIN PCB
Board No.
E259-1 (1/5)
Drawing No.
E240021



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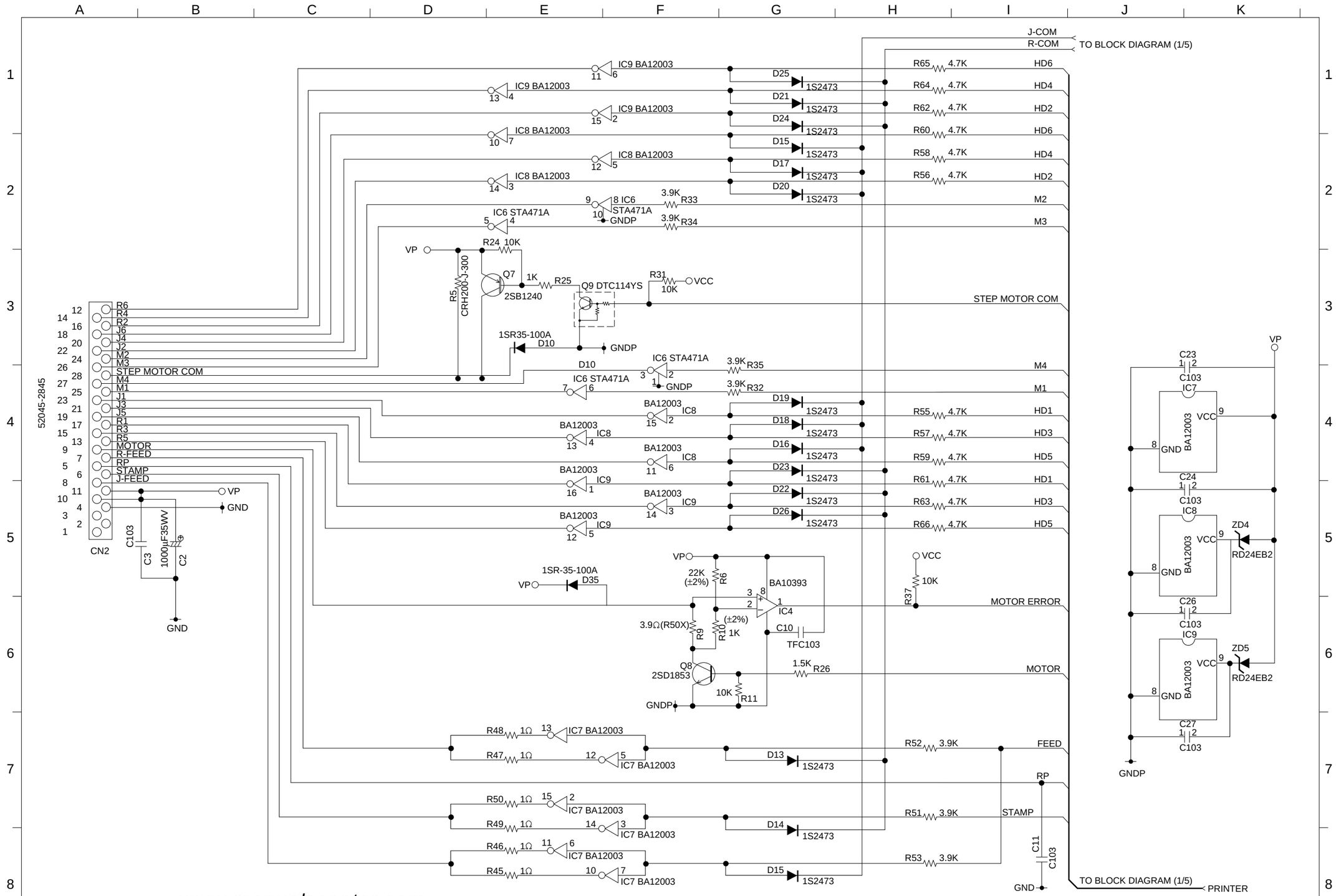
Name	Board No.	Drawing No.
MAIN PCB	E259-1 (2/5)	E240022



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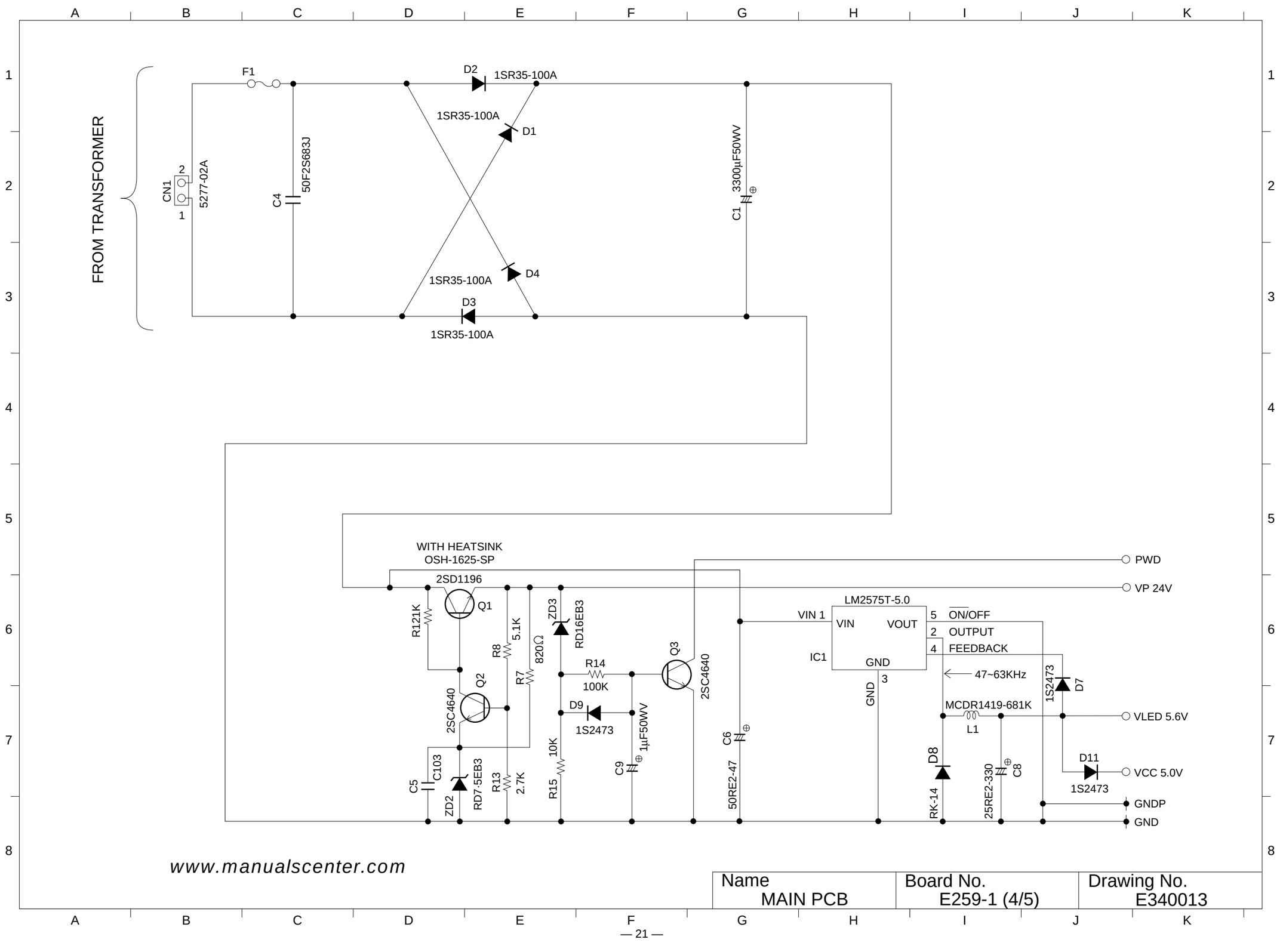
Name	Board No.	Drawing No.
MAIN PCB	E259-1 (3/5)	E240023



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Name	Board No.	Drawing No.
MAIN PCB	E259-1 (4/5)	E340013

Location No.	Specification
IC1	LM2575T-5.0/LB03
IC2	BA12004
IC3	BA12001
IC4	BA10393
IC5	µPD75517GF-400-3B9
IC6	STA471A
IC7	BA12003
IC8	BA12003
IC9	BA12003
IC10	TC74HC174AP
IC11	LC36256PLL
IC12	S-80730AN
IC13	TC74HC138AP
R1	Nil
R2	Nil
R3	Nil
R4	Nil
R5	CRH200-FH24-J-301
R6	CR-25-22KΩG-T
R7	R50XT-08J122
R8	CR-25-5.1KΩJ-T
R9	R50XT-08J3R9
R10	CR-25-1KΩG-T
R11	CR-25-10KΩJ-T
R12	CR-25-1KΩJ-T
R13	CR-25-2.7KΩJ-T
R14	CR-25-100KΩJ-T
R15	CR-25-10KΩJ-T
R16	CR-25-100ΩJ-T
R17	CR-25-100ΩJ-T
R18	CR-25-100ΩJ-T
R19	CR-25-100ΩJ-T
R20	CR-25-10KΩJ-T
R21	CR-25-10KΩJ-T
R22	CR-25-10KΩJ-T
R23	CR-25-10KΩJ-T
R24	CR-25-10KΩJ-T
R25	CR-25-1KΩJ-T
R26	CR-25-1.5KΩJ-T
R27	CR-25-56KΩJ-T
R28	CR-25-1KΩJ-T
R29	CR-25-1KΩJ-T
R30	CR-25-3.9KΩJ-T
R31	CR-25-10KΩJ-T
R32	CR-25-3.9KΩJ-T
R33	CR-25-3.9KΩJ-T
R34	CR-25-3.9KΩJ-T

Location No.	Specification
R35	CR-25-3.9KΩJ-T
R36	CR-25-10KΩJ-T
R37	CR-25-10KΩJ-T
R38	CR-25-330KΩJ-T
R39	CR-25-6.2KΩJ-T
R40	CR-25-560ΩJ-T
R41	CR-25-2KΩJ-T
R42	CR-25-16KΩJ-T
R43	CR-25-2KΩJ-T
R44	CR-25-10KΩJ-T
R45	CR-25-1ΩJ-T
R46	CR-25-1ΩJ-T
R47	CR-25-1ΩJ-T
R48	CR-25-1ΩJ-T
R49	CR-25-1ΩJ-T
R50	CR-25-1ΩJ-T
R51	CR-25-3.9KΩJ-T
R52	CR-25-3.9KΩJ-T
R53	CR-25-3.9KΩJ-T
R54	CR-25-1MΩJ-T
R55	CR-25-4.7KΩJ-T
R56	CR-25-4.7KΩJ-T
R57	CR-25-4.7KΩJ-T
R58	CR-25-4.7KΩJ-T
R59	CR-25-4.7KΩJ-T
R60	CR-25-4.7KΩJ-T
R61	CR-25-4.7KΩJ-T
R62	CR-25-4.7KΩJ-T
R63	CR-25-4.7KΩJ-T
R64	CR-25-4.7KΩJ-T
R65	CR-25-4.7KΩJ-T
R66	CR-25-4.7KΩJ-T
R67	CRH100-FH11-J-6R8
R68	CR-25-10KΩJ-T
R69	CR-25-8.2KΩJ-T
R70	CR-25-56KΩJ-T
R71	CR-25-56KΩJ-T
R72	CR-25-100KΩJ-T
R73	CR-25-150ΩJ-T
R74	CR-25-10KΩJ-T
R75	CR-25-10KΩJ-T
R76	CR-25-10KΩJ-T
R77	CR-25-10KΩJ-T
R78	CR-25-10KΩJ-T
R79	CR-25-56KΩJ-T

Location No.	Specification
RA1	MS1038F
RA2	MS5635F
RA3	MS5636F
RA4	MS5636F
RA5	MS1038F
C1	RE3-50V332M
C2	RE2-35V102M
C3	HE12TJYB103K
C4	50F2S563J
C5	HE12TJYB103K
C6	RE2-50V470M
C7	Nil
C8	RE2-25V331M
C9	RE2-50V010M
C10	ECQ-B1H-103-KF
C11	HE12TJYB103K
C12	HE12TJYB103K
C13	HE50TJYB102K
C14	HE50TJYB102K
C15	HE50TJYB102K
C16	HE50TJYB102K
C17	HE50TJYB102K
C18	HE50TJYB102K
C19	HE12TJYB103K
C20	HE40TJCH150J
C21	HE40TJCH120J
C22	HE12TJYB103K
C23	HE12TJYB103K
C24	HE12TJYB103K
C25	HE40TJYB101K
C26	HE12TJYB103K
C27	HE12TJYB103K
C28	HE12TJYB103K
C29	ECQ-B1H-103-KF
C30	ECQ-V1H-104-JZ
C31	HE12TJYB103K
C32	HE50TJYB102K
C33	HE40TJYB471K
C34	HE50TJYB102K
C35	HE50TJYB102K
C36	HE50TJYB102K
C37	HE50TJYB102K
C38	HE50TJYB102K
C39	HE50TJYB102K
C40	HE50TJYB102K
C41	ECQ-V1H-104-JZ
C42	HE12TJYB103K
C43	HE80TJYB472K

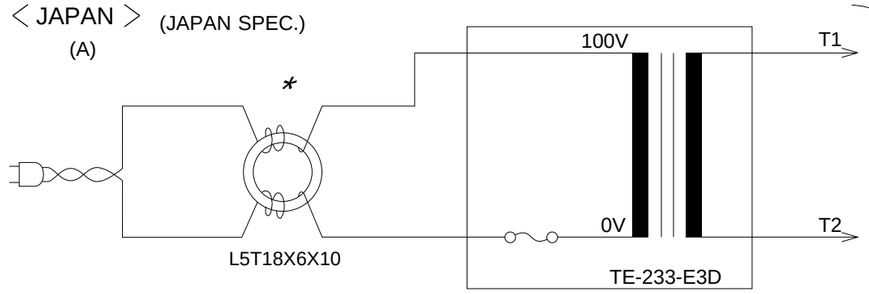
Location No.	Specification
C44	ECQ-B1H-103-KF
D1	1SR35-100A
D2	1SR35-100A
D3	1SR35-100A
D4	1SR35-100A
D5	Nil
D6	Nil
D7	1S2473
D8	RK-14
D9	1S2473
D10	1SR35-100A
D11	1S2473
D12	1S2473
D13	1S2473
D14	1S2473
D15	1S2473
D16	1S2473
D17	1S2473
D18	1S2473
D19	1S2473
D20	1S2473
D21	1S2473
D22	1S2473
D23	1S2473
D24	1S2473
D25	1S2473
D26	1S2473
D27	1SR35-100A
D28	1S2473
D29	1S2473
D30	1S2473
D31	1S2473
D32	1S2473
D33	1S2473
D34	1S2473
D35	1SR35-100A
D36	1S2473
ZD1	Nil
ZD2	RD7.5EB3
ZD3	RD16EB3
ZD4	RD24EB2
ZD5	RD24EB2
DA1	SB007W03S

Location No.	Specification
Q1	2SD1196
Q2	2SC4640
Q3	2SC4640
Q4	Nil
Q5	Nil
Q6	DTD113ZS
Q7	2SB1240
Q8	2SD1853
Q9	DTC114YS
Q10	DTC114YS
Q11	2SB1240
Q12	DTC114YS
Q13	2SB1240
Q14	DTC114YS
Q15	2SB1240
Q16	DTC114YS
Q17	2SB1240
Q18	2SD1853
X1	C-002RX (M90-76)
X2	CST4.19MGW
BUZZER	PKM22EPP-2002
L1	MCDR1419-681K/MCDR1511331K
CN1	5277-02A
CN2	52045-2845
CN3	52045-2045
CN4	53253-0310
CN5	IL-G-3P-S3T2-E
CN6	52045-2245
F1	237 315
F1	Nil
F2	UL-TSCR-0.8A

Name	Board No.	Drawing No.
MAIN PCB	E259-1 (5/5)	E340014

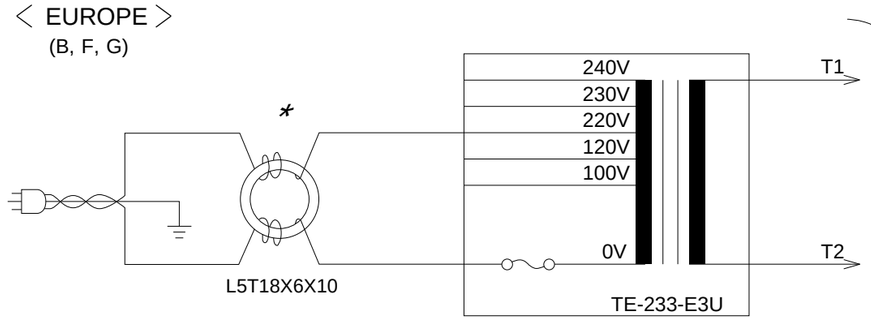
< JAPAN > (JAPAN SPEC.)

(A)



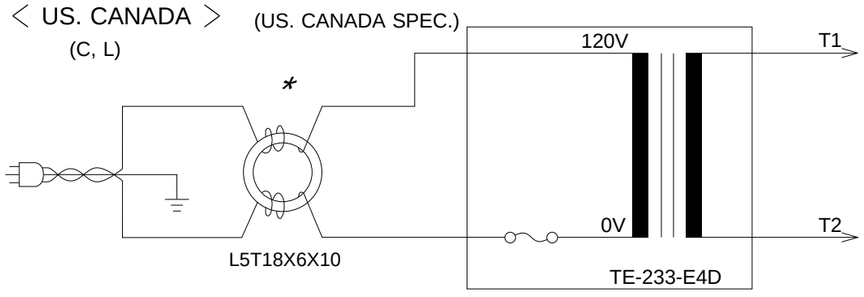
< EUROPE >

(B, F, G)



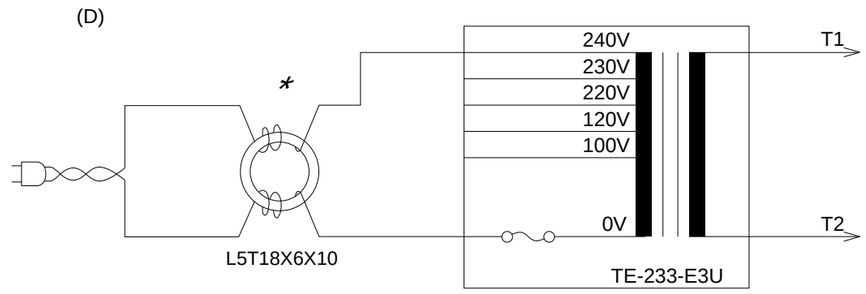
< US. CANADA > (US. CANADA SPEC.)

(C, L)



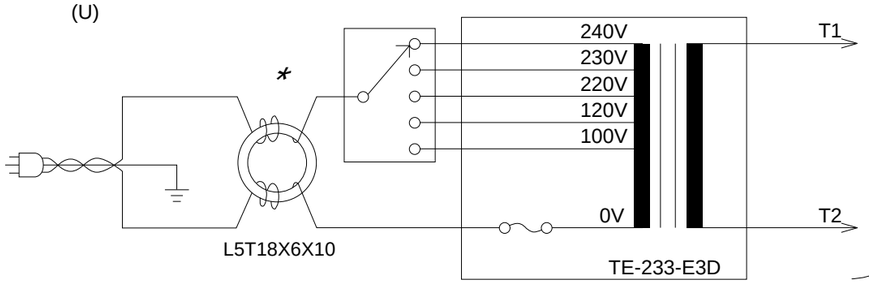
< U.K. >

(D)



< OTHER COUNTRIES > (with Voltage Selector)

(U)



TO E259-1 (4/5)

TO E259-1 (4/5)

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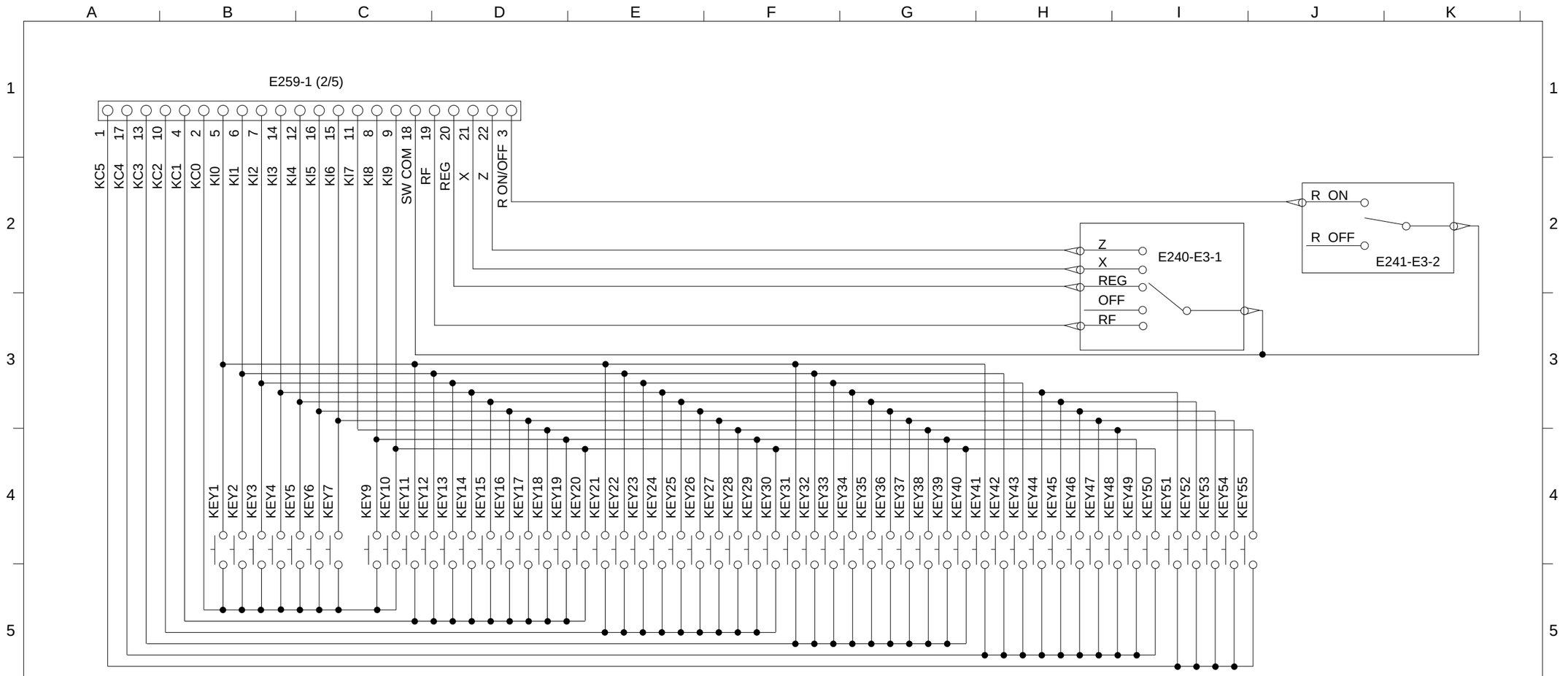
Name	Board No.	Drawing No.
POWER SUPPLY		E311531



KEY CONTACT POSITION

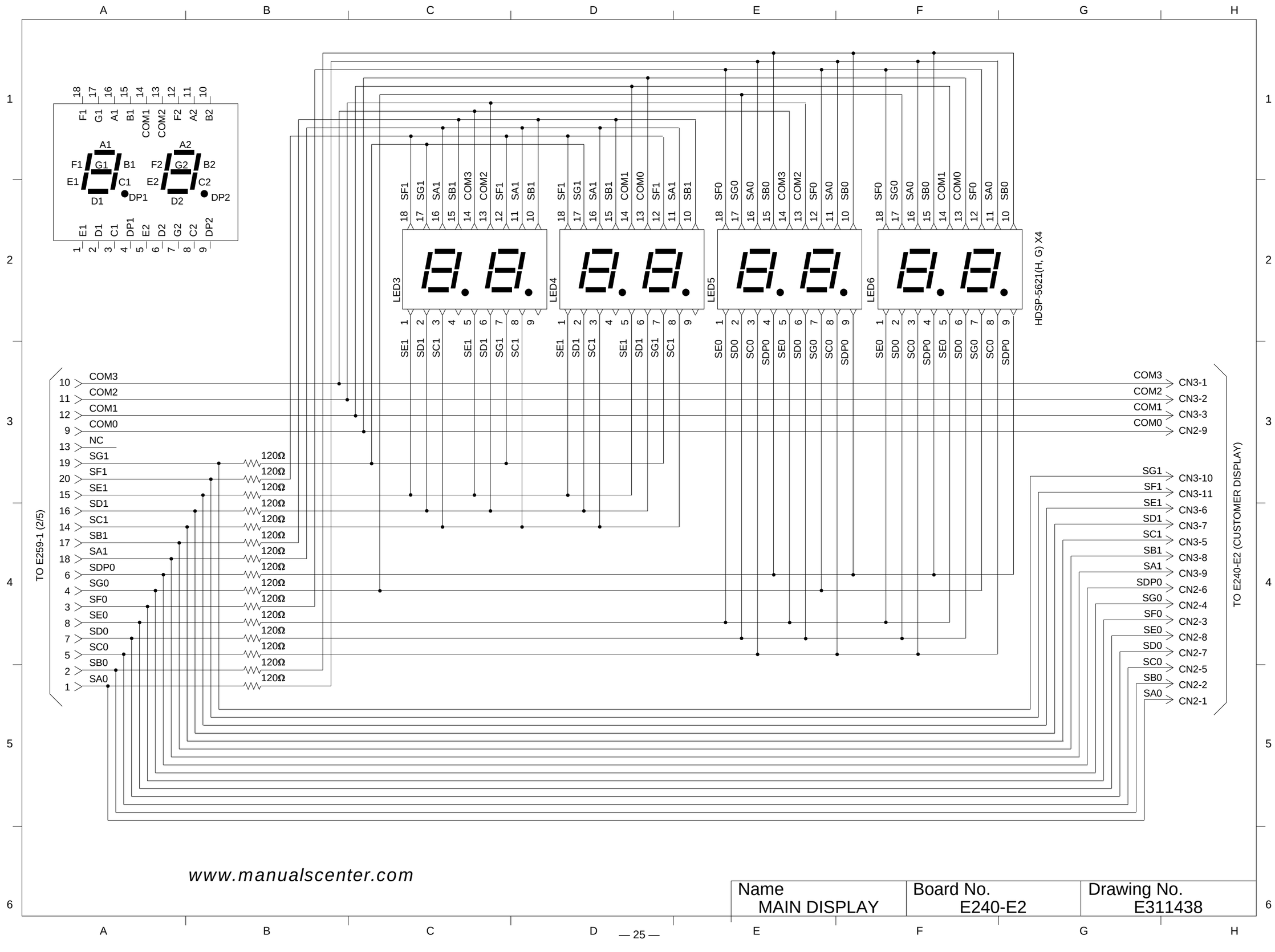
E259-E4

RFEED 49	JFEED 50			
39	40			
29	30			
19	20			
9	10			

41	42	43
31	32	33
21	22	23
11	12	13
1	2	3

51	52	53	54	55
44	45	46	47	48
34	35	36	37	38
24	25	26	27	28
14	15	16	17	18
4	5	6	7	

Name	Board No.	Drawing No.
KEYBOARD	E259-E4	E340015



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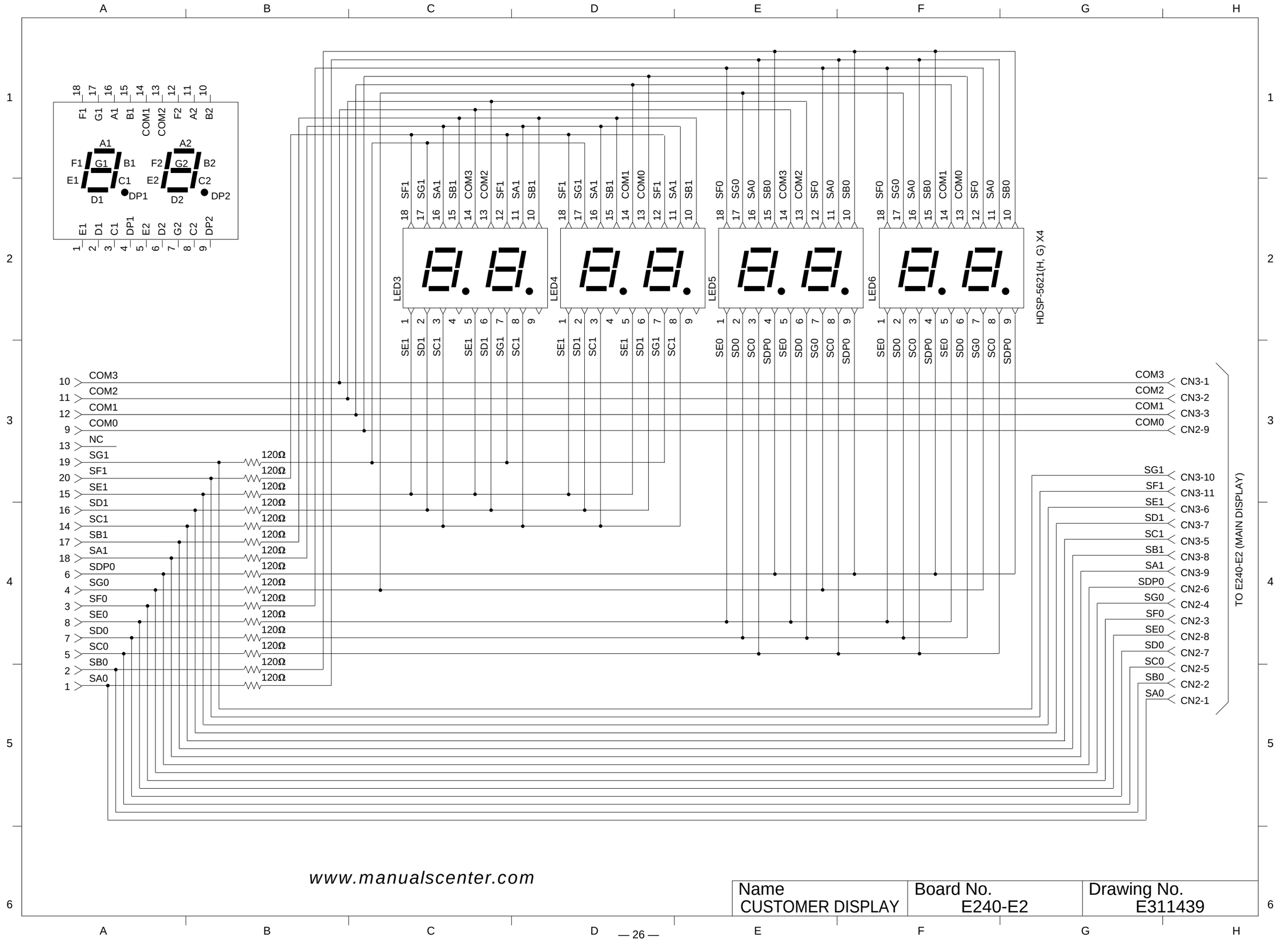
Name	Board No.	Drawing No.
MAIN DISPLAY	E240-E2	E311438



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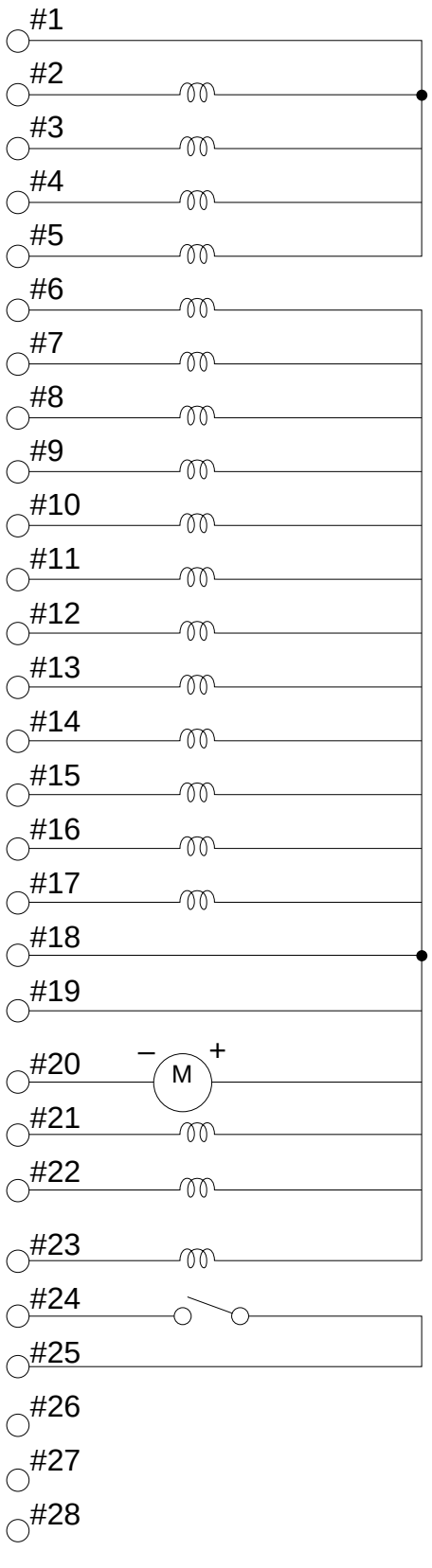
Name	Board No.	Drawing No.
CUSTOMER DISPLAY	E240-E2	E311439

E259-1 CN2 PN NO.		PRINTER PIN NO.
28	STEP MOTOR (+24V)	#1
27	STEP MPTOR COIL M4	#2
26	STEP MOTOR COIL M3	#3
25	STEP MOTOR COIL M1	#4
24	STEP MOTOR COIL M2	#5
23	J1	#6
22	J2	#7
21	J3	#8
20	J4	#9
19	J5	#10
18	J6	#11
17	R1	#12
16	R2	#13
15	R3	#14
14	R4	#15
13	R5	#16
12	R6	#17
11	VP (+24V)	#18
10	VP (+24V)	#19
9	PAPER FEED MOTOR	#20
8	J.FEED	#21
7	R.FEED	#22
6	STAMP	#23
5	RESET PULSE RP	#24
4	GND (for + 5V)	#25
3	NC	#26
2	NC	#27
1	NC	#28



Name	Board No.	Drawing No.
PRINTER WIRING		E411743

10. PARTS LIST

MODEL: CE-2400 (EX-259B)

CONTENTS

1. **Main PCB ass'y 29**
2. **Main display block 31**
3. **Customer display block 32**
4. **Keyboard block 33**
5. **Button block 34**
6. **Power supply block 36**
7. **Upper case block 37**
8. **Printer block/Printer fixing block/Others 38**
9. **Printer unit 40**
10. **Drawer unit 42**

NOTES

1. Prices and specifications are subject to change without prior notice.
2. As for spare parts order and supply, refer to the "GUIDEBOOK for Spare Parts Supply", published separately.
3. The numbers in item column correspond to the same numbers in drawing.
4. Remarks

   R - RANK
   - A : Essential
   - B : Stock recommended
   - C : Less recommended
   - X : No stock recommended

   Q - Quantity used per unit

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1. Main PCB ass'y

Item	Code No.	Parts Name	Specification	Version	Q	R
	MAIN PCB ASS'Y					
	6193 3602	Main PCB ass'y (E259-1)	E211743*2		1	A
IC11	2006 1235	LSI	LC36256AL70/85/10		1	A
IC5	2006 1606	LSI	UPD75517GF-400-3B9		1	A
IC13	2101 0189	MOS IC	TC74HC138AP		1	A
IC10	2105 1071	C-MOS IC	TC74HC174AP		1	A
IC4	2114 1512	Liner IC	BA10393		1	A
IC7,8,9	2114 2436	Monolythic IC	BA12003		3	A
IC2	2120 6741	Monolythic IC	BA12004		1	A
IC1	2120 6823	Liner IC	LM2575T-5.0/LB03		1	A
IC6	2120 6824	Monolythic IC	STA471A		1	A
IC12	2120 7381	Reset IC	S-80730AN-Z		1	A
IC3	2120 9181	Monolythic IC	BA12001		1	A
Q7,11,13,15,17	2210 7309	Transistor	2SB1240V2-Q,R		5	B
Q2,3	2220 3746	Transistor	2SC4640(T,U)-AC		2	B
Q8,18	2230 4135	Transistor	2SD1853-AA		2	B
Q1	2230 5336	Transistor	2SD1196		1	B
Q6	2250 1099	Digital transistor	DTC113ZS-TP-T		1	B
Q9,10,12	2259 0063	Digital transistor	DTC114YS-TP-T		5	B
D1~4,10	2301 0089	Diode	1SR35-100A-T-82-T		7	C
D7,9,11~26	2301 0101	Diode	1S2473-T-77-T		26	C
ZD3	2310 6728	Zener Diode	RD16EB3-TN-T		1	B
ZD4,5	2310 7229	Zener Diode	RD24EB2-TN-T		2	B
ZD2	2310 9449	Zener Diode	RD7.5EB3-TN-T		1	B
DA1	2310 9450	Shottky barrier diode	SB007W03S-AC		1	B
D8	2310 9452	Shottky barrier diode	RK-14V		1	B
X1	2520 3445	Crystal oscillator	C-002RX(M90-76)		1	A
R45~50		Carbon film resistor	CR-25-1OHMJ-T		6	X
R16~19		Carbon film resistor	CR-25-100OHMJ-T		4	X
R73		Carbon film resistor	CR-25-150OHMJ-T		1	X
R40		Carbon film resistor	CR-25-560OHMJ-T		1	X
R12		Carbon film resistor	CR-25-1KOHMJ-T		4	X
R10		Carbon film resistor	CR-25-1KOHMG-T		1	X
R26		Carbon film resistor	CR-25-1.5KOHMJ-T		1	X
R41,43		Carbon film resistor	CR-25-2KOHMJ-T		2	X
R13		Carbon film resistor	CR-25-2.7KOHMJ-T		1	X
R30,32~35		Carbon film resistor	CR-25-3.9KOHMJ-T		8	X
R55~66		Carbon film resistor	CR-25-4.7KOHMJ-T		12	X
R8		Carbon film resistor	CR-25-5.1KOHMJ-T		1	X
R39		Carbon film resistor	CR-25-6.2KOHMJ-T		1	X
R69		Carbon film resistor	CR-25-8.2KOHMJ-T		1	X
R11,15,20~24		Carbon film resistor	CR-25-10KOHMJ-T		17	X
R6		Carbon film resistor	CR-25-22KOHMG-T		1	X
R27,70,71,79		Carbon film resistor	CR-25-56KOHMJ-T		4	X
R14,72		Carbon film resistor	CR-25-100KOHMJ-T		2	X
R38		Carbon film resistor	CR-25-330KOHMJ-T		1	X
R54		Carbon film resistor	CR-25-1MOHMJ-T		1	X
R9		Carbon film resistor	R50XT-08J3R9		1	X
R7		Carbon film resistor	R50XT-08J122		1	X
R42		Carbon film resistor	CR-25-16KOHM-J-T		1	X
R5		Metal film resistor	CRH200-FH24-J-301		1	X
R67		Metal film resistor	CRH100-FH11-J-6R8		1	X

Item	Code No.	Parts Name	Specification	Version	Q	R
RA2		Module resistor	MS5635F		1	C
RA3,4		Module resistor	MS5636F		2	C
RA1,5		Module resistor	MS1038F		2	C
X2	2801 8932	Ceramic oscillator	CST4.19MGW		1	A
C6	2807 2231	Electrolytic capacitor	RE2-50V470M-T2		1	C
C9	2807 2238	Electrolytic capacitor	RE2-50V010M-T2		1	C
C8	2807 2245	Electrolytic capacitor	RE2-25V331M-T2		1	C
C2	2807 2252	Electrolytic capacitor	RE2-35V102M		1	C
C1	2807 2259	Electrolytic capacitor	RE3-50V332M		1	C
C21		Ceramic capacitor	HE40TJCH120J		1	X
C13~18,32, C34~40		Ceramic capacitor	HE50TJYB102K		14	X
C20		Ceramic capacitor	HE40TJCH150J		1	X
C43		Ceramic capacitor	HE80TJYB472K		1	X
C33		Ceramic capacitor	HE40TJYB471K		1	X
C25		Ceramic capacitor	HE40TJYB101K		1	X
C3,5,11,12,19 C22~24,26~28 C31,42		Ceramic capacitor	HE12TJYB103K		13	X
C30,41		TF capacitor	ECQ-V1H-104-JZW		2	X
C10,29,44		TF capacitor	ECQ-B1H103KFW		3	X
C4		Mylar capacitor	50F2S563J		1	X
F1	3000 6559	Fuse	237 315		1	A
L1	3018 0854	Inductor	MCDR1419-681K		1	X
BUZZER	3122 1589	Sounducer	PKM22EPP-2002		1	C
CN5	3500 3355	Pin ass'y 3P	IL-G-3P-S3T2-E		1	C
CN3	3500 5831	PCB connector	52045-2045		1	C
CN4	3500 7122	Pin ass'y	53253-0310		1	C
CN2	3501 5460	FFC connector	52045-2845		1	C
CN6	3501 5474	FFC connector	52045-2245		1	C
CN1	3510 2680	Pin ass'y 2P	5277-02A		1	C
F2	3631 0328	Fuse	UL-TSCR-0.8A		1	A
F1	3640 2331	Fuse clip	UF-0033		2	X
		Heat sink	OSH-1625-SPL		1	X
		PCB E259-1 (without components)	E211747-1		1	X
		Screw (+)	3X8 ZMC-3		1	X

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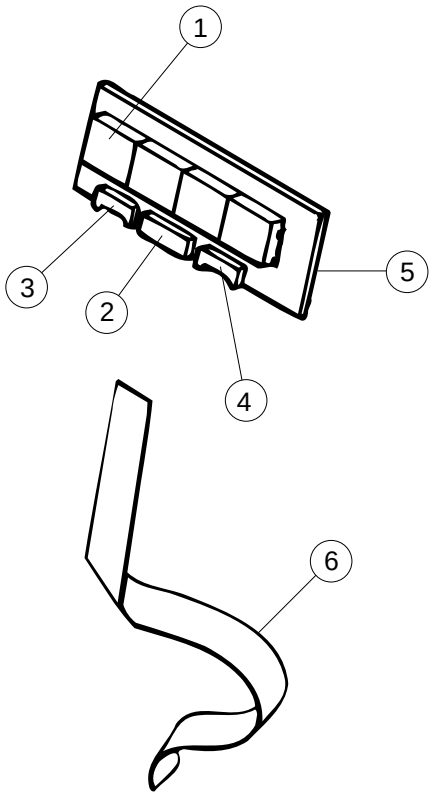
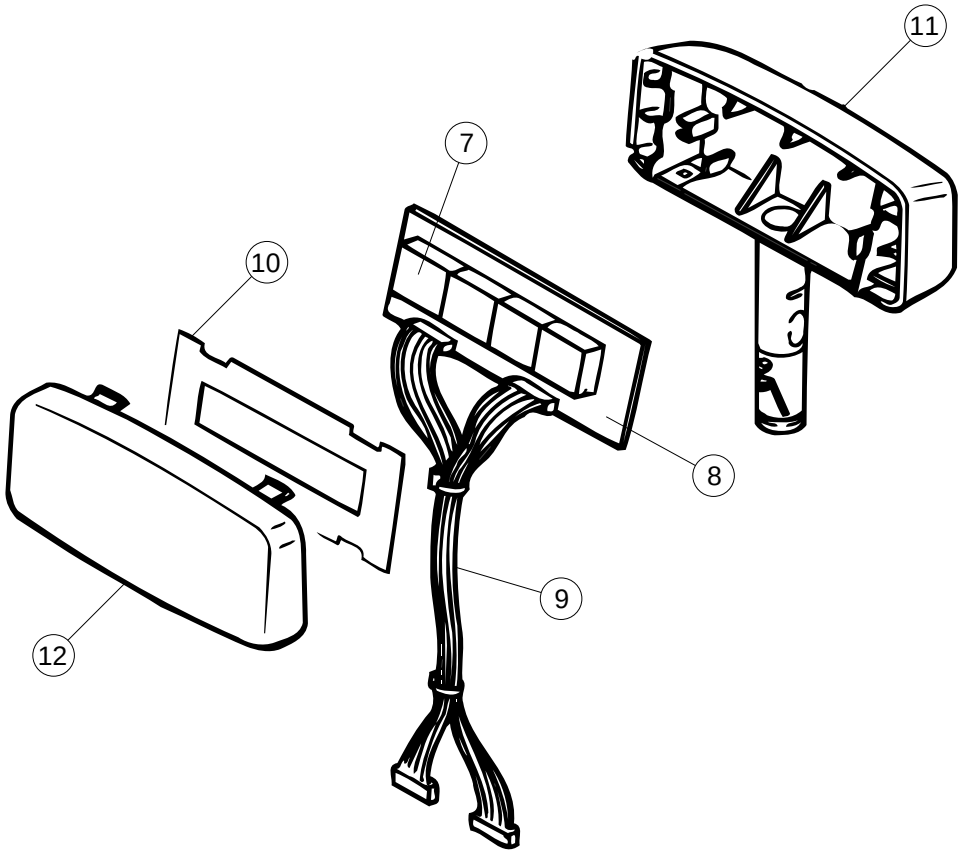
2. Main display block



Item	Code No.	Parts Name	Specification	Version	Q	R
	MAIN DISPLAY BLOCK					
1	2320 1365	LED	HDSP-5621#S02		4	A
		Carbon film resistor	ERD25TJ121V		8	X
		Carbon film resistor	ERDS2TJ121V		7	X
2	3500 5833	PCB connector	52044-2045		1	C
3	3500 5834	Pin ass'y 9P	53254-0910		1	C
4	3500 5835	Pin ass'y 11P	53254-1110		1	C
5	4306 1004	PCB E240-E2 (without components)	E311067A-1		1	X
6	6221 3899	FFC joiner A	E411354-4		1	A

3. Customer display block



Item	Code No.	Parts Name	Specification	Version	Q	R
CUSTOMER DISPLAY BLOCK						
7	2320 1365	LED	HDSP-5621#S02		4	A
		Carbon film resistor	ERD25TJ121V		8	X
		Carbon film resistor	ERDS2TJ121V		7	X
8	4306 1004	PCB E240-E2 (without components)	E311067A-1		1	X
9	6191 0334	Display connector ass'y	E311301*1		1	B
10	6221 4059	Blind sheet R	E311214-1		1	X
11	6245 5470	Display case	E210920B-1		1	X
12	6246 3170	Rear case B	E210921B-2		1	C

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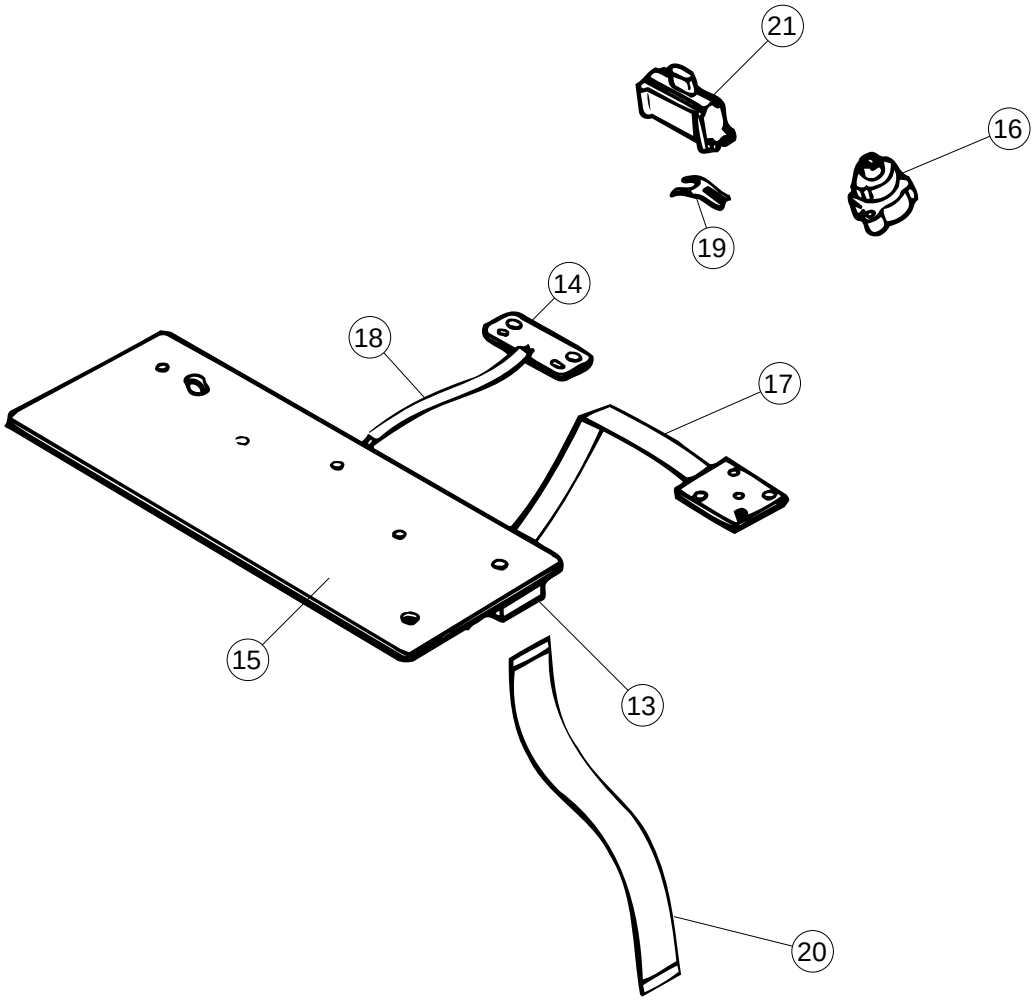
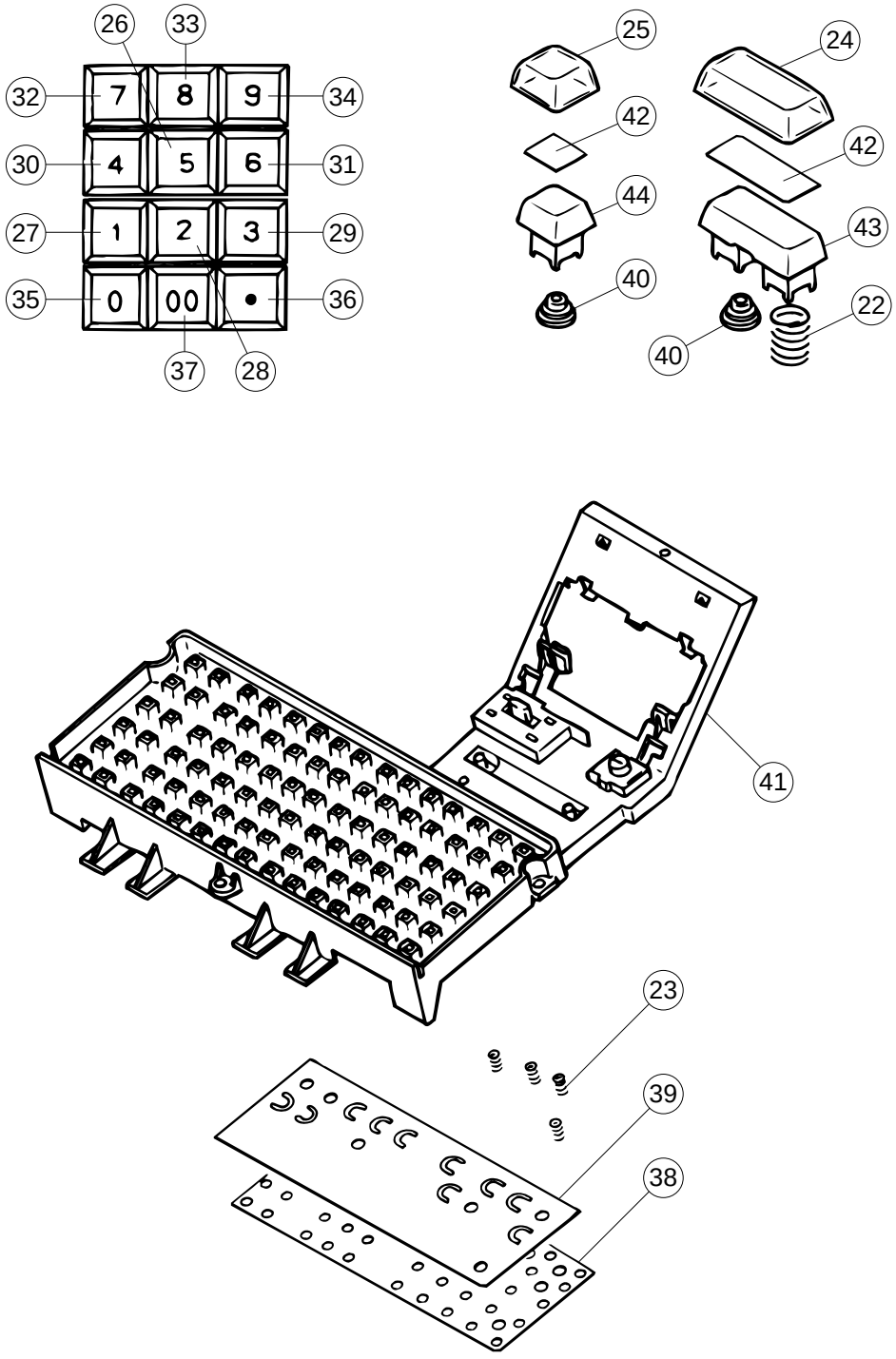
4. Keyboard block



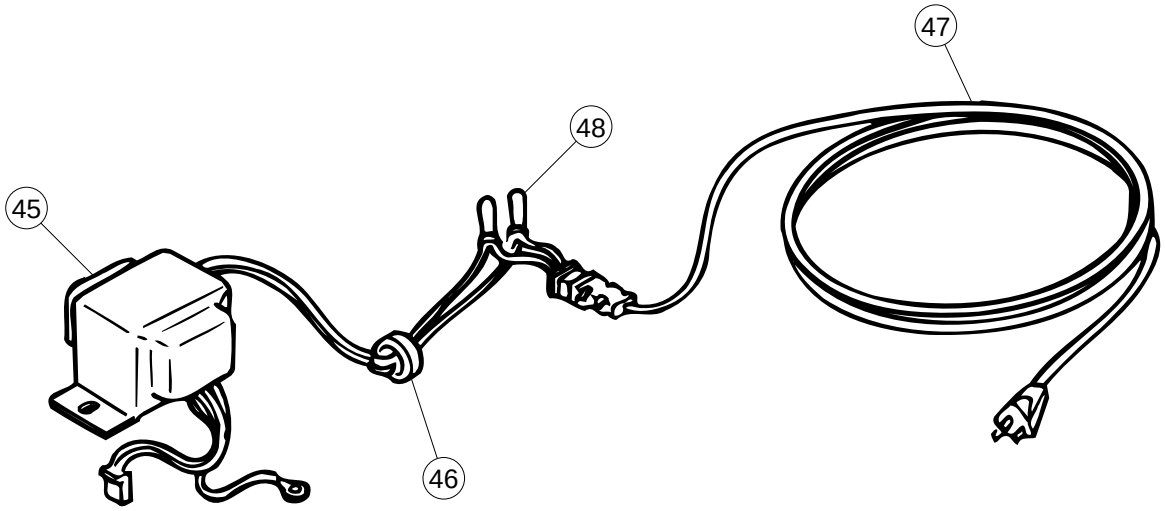
Item	Code No.	Parts Name	Specification	Version	Q	R
	KEYBOARD BLOCK					
13	3501 5474	FFC connector	52045-2245		1	A
14	4306 1013	PCB E241-E3-2 (without components)	E311071A-1		1	X
15	4308 1074	PCB E241-E4 (without components)	E312009-1		1	C
16	6191 0102	Mode key switch ass'y	E311288*1		1	C
17	6231 9577	PC joiner A	E411356A-1		1	A
18	6231 9578	PC joiner B	E411356A-2		1	A
19	6029 0326	Switch contact spring	A4897C-1		1	C
		Tapping screw (+) (for mode key)	2.6X8 ZMC-3..		2	X
		Screw with washer (for keyboard)	3X8 ZMC-3.....		6	X
20	6246 4790	FFC joiner	E412212-2		1	A
21	6246 9616	Slide knob	E311468A-1		1	X

5. Button block



Item	Code No.	Parts Name	Specification	Version	Q	R
	BUTTON BLOCK					
22	6247 3830	Coil spring A	E411104A-1		1	C
23	6247 3837	Coil spring B	E411104A-2		10	C
24	6221 3988	L cap	E210964-1		1	C
25	6221 4025	S cap	E311103-1		41	C
26	6221 4356	S button 5	E311116-3		1	C
27	6221 4360	S button 1	E311279-1		1	C
28	6221 4361	S button 2	E311279-2		1	C
29	6221 4362	S button 3	E311279-3		1	C
30	6221 4363	S button 4	E311279-4		1	C
31	6221 4364	S button 6	E311279-5		1	C
32	6221 4365	S button 7	E311279-6		1	C
33	6221 4366	S button 8	E311279-7		1	C
34	6221 4367	S button 9	E311279-8		1	C
35	6221 4368	S button 0	E311279-9		1	C
36	6221 4369	S button .	E311279-10		1	C
37	6221 4370	S button 00	E311279-11		1	C
38	6221 4420	Spacer	E311240-1		1	A
39	6221 4421	Common sheet	E311241-1		1	A
40	6221 5086	Contact rubber	E411820-1		54	A
	6246 2000	Button filer S	E412129-2		2	C
41	6246 3140	Button frame	E110218B-1		1	X
42	6246 5470	Plate sub ass'y	E340500*1	U.S.A.	1	C
43	6246 7761	L button	E210963A-3		1	C
44	6246 7803	S button	E311101A-3		53	C

6. Power supply block



Item	Code No.	Parts Name	Specification	Version	Q	R
POWER SUPPLY BLOCK						
45	3000 3020	Power transformer	TE-233-E4D		1	A
46	3030 4055	Ferrite core	L5T18X6X10		1	X
47	3700 4281	Power cord	PS204		1	C

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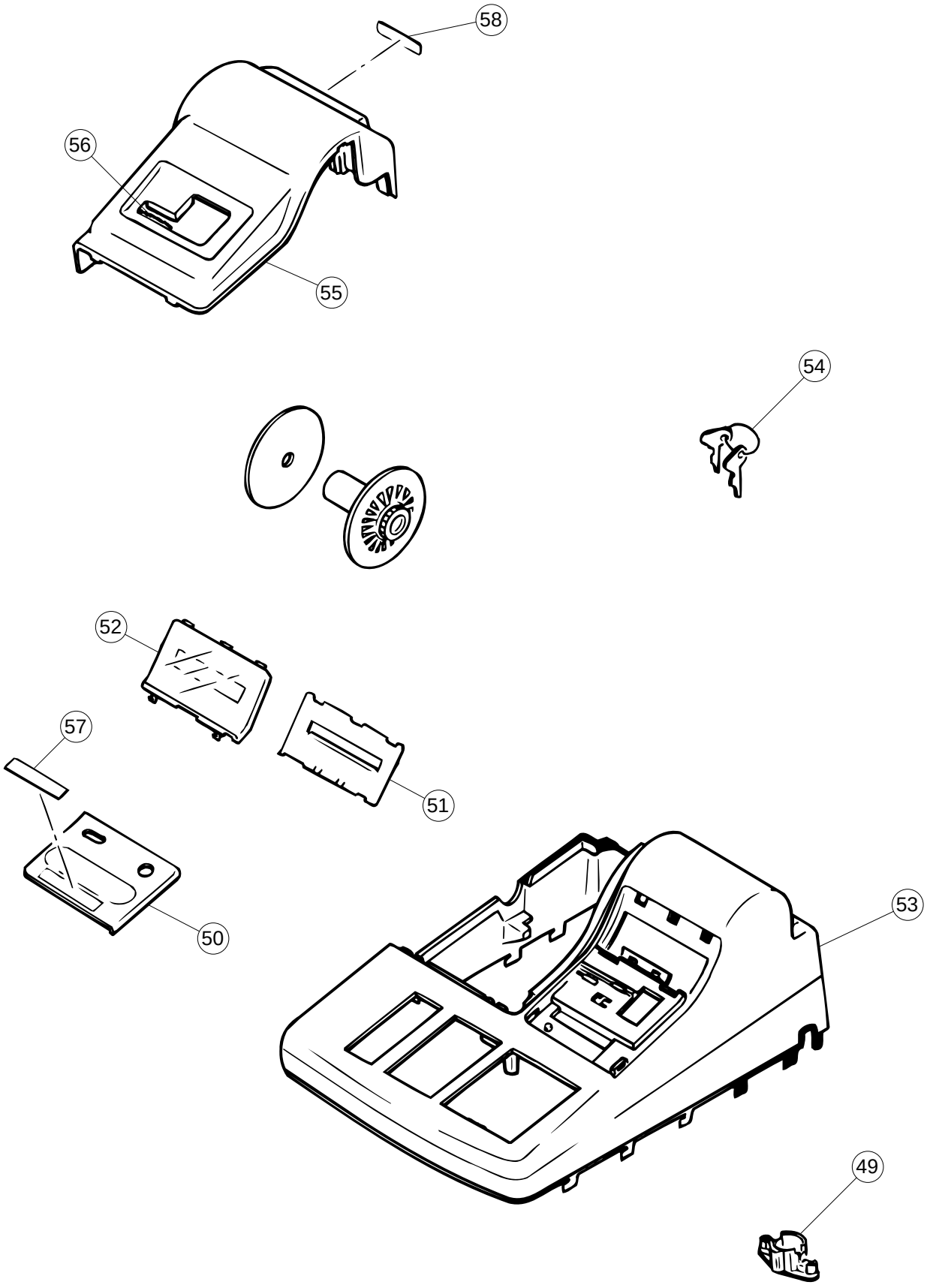
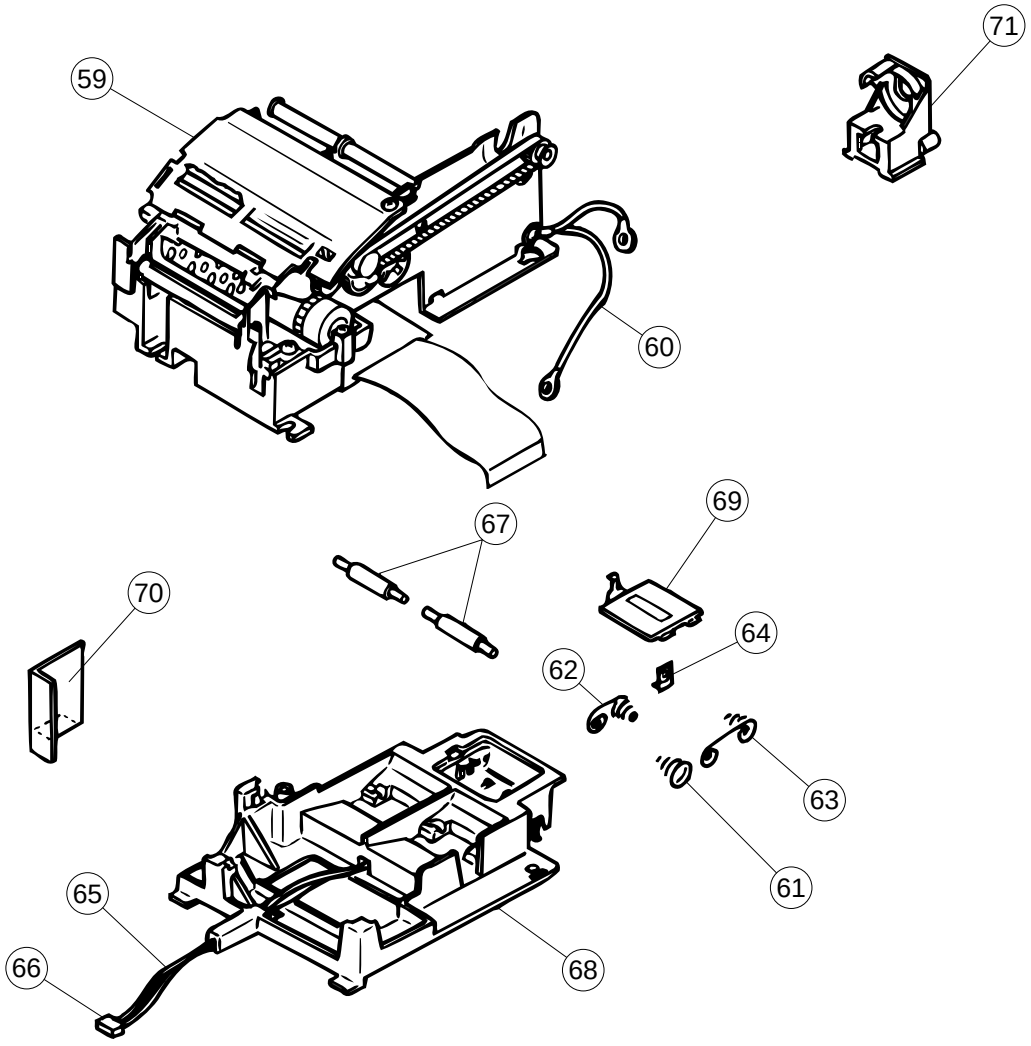
7. Upper case block



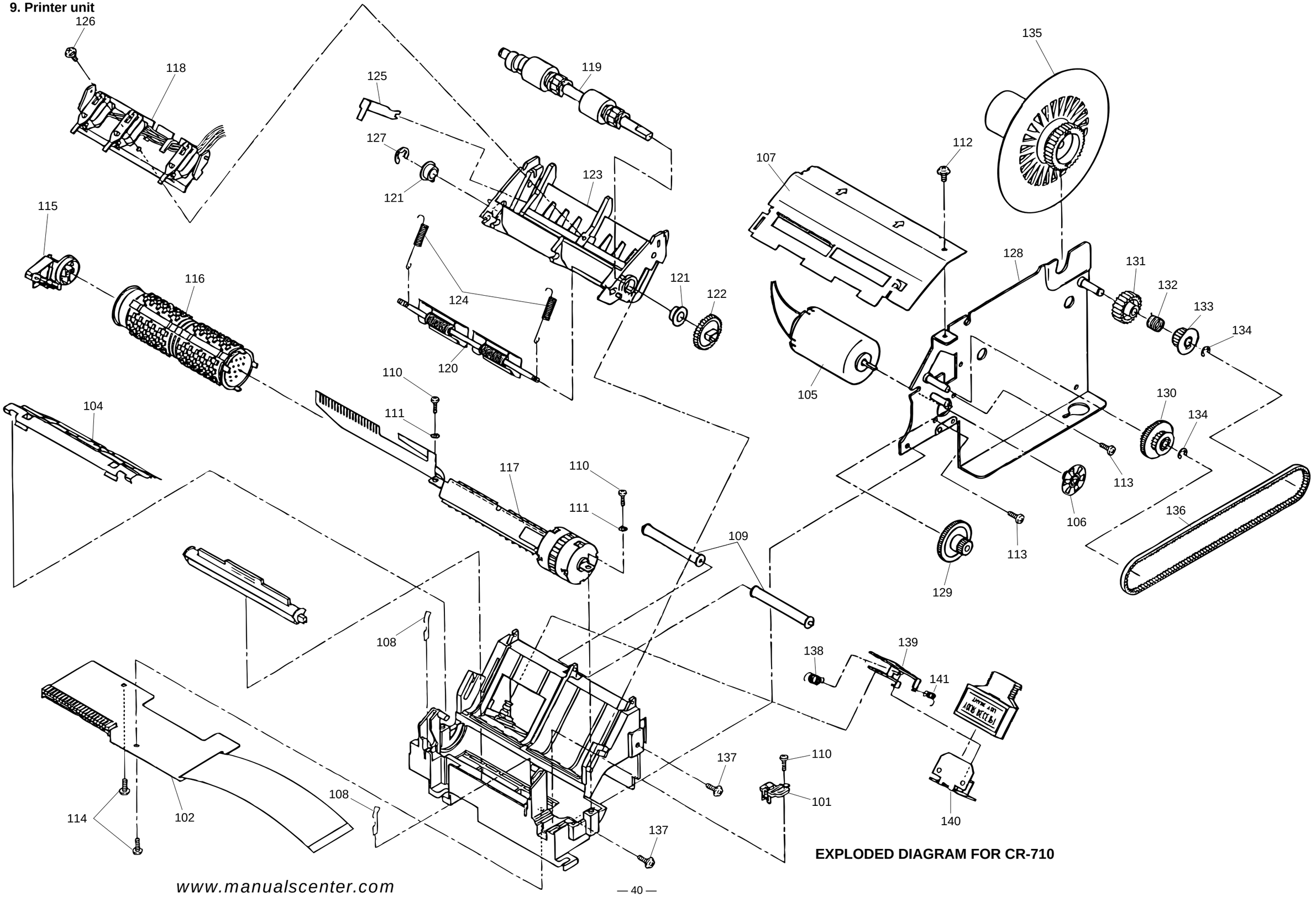
Item	Code No.	Parts Name	Specification	Version	Q	R
		UPPER CASE BLOCK				
		Screw with washer	3X20 ZMC-3..		2	X
		Screw with washer	3X8 ZMC-3.....		5	X
49	6220 2505	Display bush	E310377-1		1	X
50	6247 5195	Mode cover B	E210953B-2		1	C
51	6221 4061	Blind seal	E311215-1		1	X
52	6246 3330	Display window A	E210952A-10		1	B
53	6246 4740	Upper case	E110216-10		1	X
54	6218 4957	Key set sub ass'y	E44596A*1		1	B
	6218 4965	OP key	E44549-1		2	B
	6218 4973	OW key	E44549-3		2	B
55	6221 3878	Printer cover	E110217-1		1	C
56	6216 1949	Paper cutter	E42778-1		1	C
57	6246 4780	Name plate	E412211-3		1	X
58	6221 3812	Name label	E411379-1		1	X

8. Printer block/Printer fixing block/Others



Item	Code No.	Parts Name	Specification	Version	Q	R
	PRINTER BLOCK					
59	1000 8141	Printer unit	CR-710-001MA		1	A
		Screw	4X8 ZMC-3...		1	X
60	6191 0077	FG wire ass'y	E411673*1		1	X
	PRINTER FIXING BLOCK					
61	6000 6091	Battery spring G67	A43656-1		1	C
62	6001 0862	Battery spring B-1	P408-1		1	C
63	6001 0871	Battery spring B-2	P409-1		1	C
64	6322 4499	Battery spring A	A42606-1		1	C
65	6191 0080	Lead wire ass'y	E411694*1		1	C
66	6191 0081	Connector ass'y	E411695*1		1	C
67	6221 4762	Paper roller	E411696-1		2	C
68	6231 9641	Printer fixing stand	E210951A-1		1	X
69	6221 3888	Battery cover	E311096-1		1	B
70	6221 4069	Printer earth plate	E411500-1		1	X
	OTHERS					
71	6221 3886	V/B connector fixing plate	E311094-1		1	X
		Screw with washer	3X8 ZMC-3		9	X
		Screw with washer	3X10 ZMC-3...		1	X
		Screw	3X8.ZMC-3		1	X
		Locking spacer	SPLS-8		5	X
		Washer	4		2	X
		Screw with washer	3X32 ZMC-3		1	X
		Screw with washer	4X6 ZMC-3		3	X
		Screw with washer	3X8 ZMC-3		2	X
		Washer	6.6XØ17X1.2 ZMC-3		1	X
		Washer	4		3	X

9. Printer unit



EXPLODED DIAGRAM FOR CR-710

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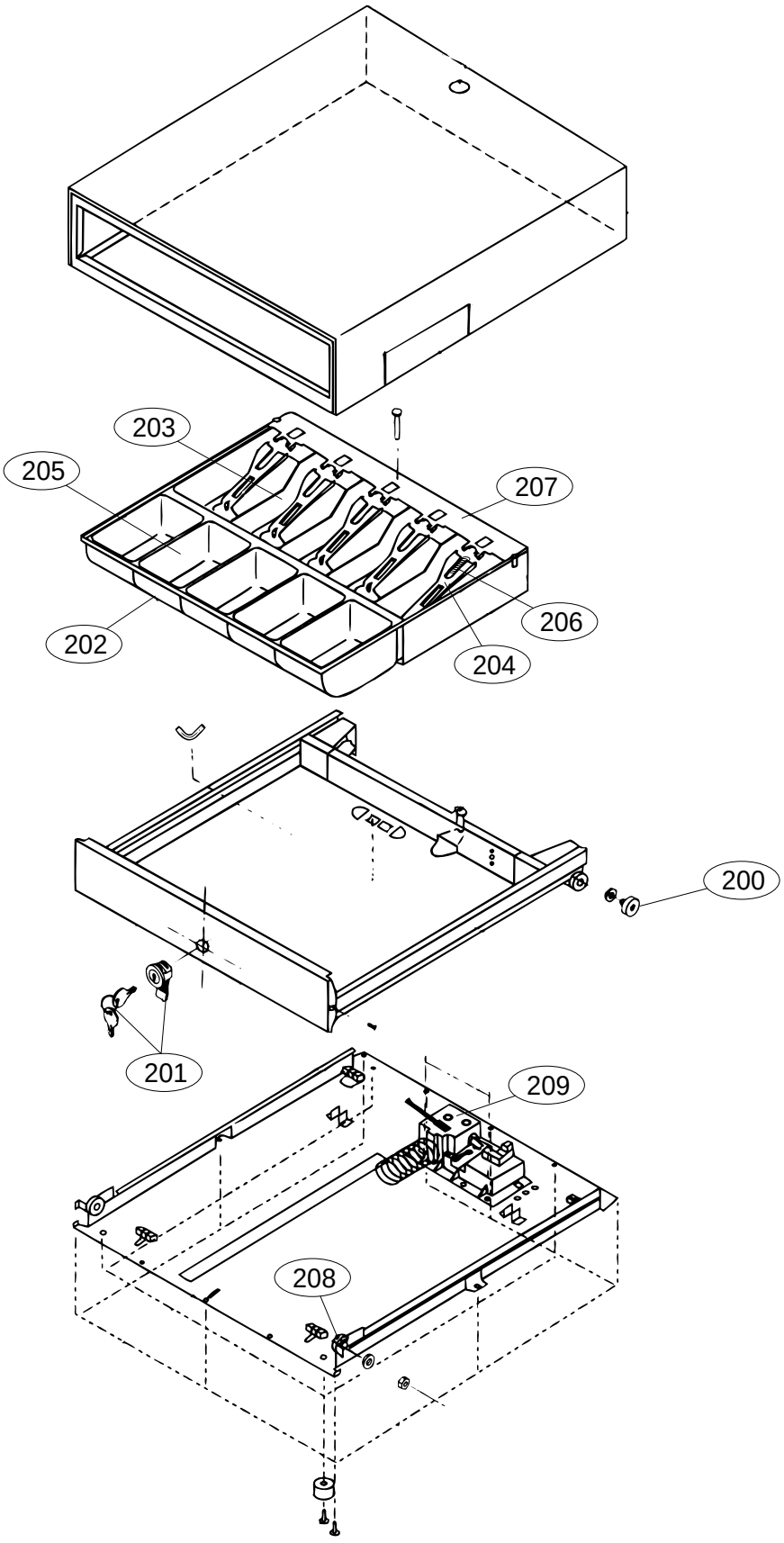
Item	Code No.	Parts Name	Specification	Version	Q	R
101	1909 1665	Derent pawl ass'y	F750003000		1	X
102	1909 1666	Board ass'y A	F750004000		1	X
104	1909 1667	Paper guide ass'y	F750006000		1	B
105	1909 1668	Paper feed motor	F750005020		1	A
106	1909 1669	First reduction gear	F750005030		1	A
107	1909 1670	Printer cover	F750005040		1	X
108	1909 1671	Ink roll spring	F750005050		2	X
109	1909 1672	Paper inlet roller	F750005060		2	X
110	1903 0733	C.T.B. screw M2.5 x 8	B012601011		3	X
111	1909 1673	Outside toothed lock washer M2.6	B090650112		2	X
112	1908 5554	C.C.S. screw M3 x 5	B300304111		1	X
113	1903 0632	C.B.screw M3 x 4	B010350111		2	X
114	1909 1674	C.T.B. screw 3 x 6	B013001611		2	X
115	1909 1675	R detector ass'y	F750055000		1	A
116	1909 1676	Typeface sheet receptacle ass'y C	M751001020		1	A
117	1909 1677	Typeface motor print ass'y A	F750651000		1	A
118	1909 1678	Paper feed trigger ass'y	F750252000		1	X
119	1909 1679	Paper feed shaft ass'y	F750254000		1	A
120	1909 1680	Paper hold roller shaft ass'y	F750255000		1	X
121	1903 0140	Paper feeding shaft holder	F701252020		2	X
122	1909 1681	Paper feed gear	F750251010		1	A
123	1909 1682	Paper feed frame	F750251020		1	X
124	1909 1683	Paper hold spring	F750251030		2	X
125	1909 1684	No.1 stamp drive lever	F750251040		1	X
126	1909 1674	C.T.B. screw 3x 6	B013001611		1	X
127	1903 0788	Retaining ring Type-E (5)	B150300811		1	X
128	1909 1685	Take-up frame sub ass'y	F751303000		1	X
129	1909 1686	Second reduction gear A	F750302010		1	C
130	1909 1687	Second reduction gear B	F750302020		1	C
131	1909 1688	Paper take-up drive gear	F750302030		1	C
132	1909 1689	Roller torque spring	F750302040		1	X
133	1909 1690	Paper take-up drive pulley	F750302050		1	C
134	1903 0787	Retaining ring Type-E(3)	B150300611		2	X
135	1903 0177	Paper roller shaft	F703301010		1	X
136	1909 1691	Paper take-up belt	F244307030		1	C
137	1908 5554	C.C.S. screw M3 x 5	B300304111		2	X
138	1909 1692	Stamp force adjustment spring	F750451010		1	X
139	1909 1693	No.2 stamp drive lever	F750451020		1	X
140	1909 1624	Stamp lever	F240251020		1	X
141	1909 1694	Stamp return spring	F750451030		1	X

10. Drawer unit

DL-2416 (for U.S.A.)



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Item	Code No.	Parts Name	Specification	Version	Q	R
	DL-2416 (U.S.A)					
	6246 3490	Drawer unit	E412161*4		1	
200	5800 0043	Roller	DR-19B-1.0		2	B
201	6221 4900	Cylinder lock	ZD20025		1	C
202	6192 6350	Bill/Coin case ass'y	E110387*2		1	C
203	6221 4911	Partition plate	ZD43652		4	B
204	6221 4902	Bill holder	ZD18931		5	A
205	6221 4909	Bill/Coin case	ZD43651		1	C
206	6246 5220	Bill holder spring	E412160-1		5	A
207	6246 5240	Bill holder fixing plate	E211621-1		1	C
208	5500 0619	Roller	DR-19B1		2	A
209	6192 6317	Lock ass'y	E211680*5		1	C
210	6246 6865	Lock fixing stand	E211622A-1		1	X
211	6246 5020	Hook lever shaft	E412071-1		1	X
212	6246 4940	Hook lever	E311876-1		1	X
213	6246 5010	Push spring	E412069-1		1	C
214	5580 1461	Lock spring	ZD03441-A		1	C
215	3000 7231	Micro switch	V-103-1A5		1	C

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